

Upcoming Events

Board of Directors Meeting

May 5th at the Cumberland Valley Girl Scout Council Building – 7:30 pm

June 2nd at the Cumberland Valley Girl Scout Council Building – 7:30 pm

Membership Meeting

May 19th at the Adventure Science Center – 7:30 pm

June 16th at the Adventure Science Center – 7:30 pm

Star Parties

May 7th - BSAS Public Star Party at Long Hunter State Park
8:00 – 10:00 pm

June 3rd - BSAS Public Star Party at Bells Bend Outdoor Center

June 4th - BSAS Private Star Party and Picnic at Spot Observatory

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An Update on Astronomy Activities at Austin Peay State University

Thursday, May 19, 2011
Adventure Science Center
7:30 pm



Dr. J. Allyn Smith will be giving us an update on observing facilities and projects, student and outreach activities, class developments, and more. See you there!



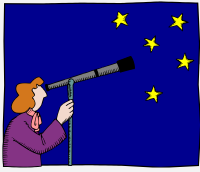
From The President

Greetings and clear skies from your BSAS president. The month of May once again arrives with flooding rivers but this time it is our neighbors to the west. The Mississippi river is swollen with spring rains and record snow melt from the midwest. While we have seen some high water on the Cumberland and its tributaries it is nothing like we saw last year. It seems that record spring floods are becoming all too common. While some may say it is global warming, most reputable climatologist will say that, so far, it's just weather. If it floods for a year or two, that's weather. If it does it for five years in a row, that's climate change. Let's hope next year brings us back to more normal weather.

As promised, the BSAS board of directors sent out an email survey to all members concerning a possible change to the clubs meeting date. While the response wasn't overwhelming, there was a clear plurality for changing the meeting date to the third Wednesday of the month. A change in the meeting date will require amending the clubs bylaws so a formal proposal will be placed before the members in next month's newsletter. There are a number of other old items in the bylaws that need to be changed as well so we are going to put it all together as a single package. If we publish the proposed amendments in the June newsletter that means we will vote on the measure at the July meeting. I know that is still a couple of months away but please mark the July 21 meeting on your calendar. I would really like to see a large turnout for the vote.

In the meantime, we have our May meeting coming up on May 19. This month we will hear from Dr. J. Allyn Smith about all the new astronomy activities going on at Austin Peay State University. Last summer (and last month) we heard from Middle Tennessee State University so this summer, at least for May, we turn our gaze north to Clarksville. We will hear from other universities in the area, specifically a couple of talks from Vanderbilt professors and another talk from an MTSU professor, in the coming months as well so that members can see for themselves just how big astronomy is among the professionals in Tennessee. For a state with such notoriously poor skies, after all we are the home of the Smokey Mountains, astronomy is really a big deal here in the volunteer state.

Continued on Page 2



"We find, therefore, under this orderly arrangement, a wonderful symmetry in the universe, and a definite relation of harmony in the motion and magnitude of the orbs, of a kind that is not possible to obtain in any other way."

Johannes Kepler
1571-1630

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 2011

05/03 NEW Moon
05/10 FIRST Quarter
05/17 FULL Moon
05/24 LAST Quarter

June 2011

06/01 NEW Moon
06/09 FIRST Quarter
06/15 FULL Moon
06/23 LAST Quarter

OBJECTS VISIBLE THIS MONTH

Messier Objects:

Galaxies:

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

Caldwell Objects:

C-59 – The Ghost of Jupiter (Planetary Nebula)
C-25 – The Intergalactic Wanderer (Globular Cluster)
C-52 – The Spindle Galaxy
C-32 – The Whale Galaxy

From the President, cont.

Because of how the phase of the moon is this month, we only had one public star party in May and it was at Long Hunter State Park on Saturday May 7. The skies were not so good but there were a few glimpses of the Moon and Saturn. A local Boy Scout troop was on hand and thoroughly enjoyed the limited views that were available. Our next public star party is Friday June 4 at the Bells Bend Outdoor Center. The Bells Bend site is perhaps our darkest star party site so plan on coming out and enjoying the views in early June. There will only be a tiny sliver of a two day old Moon so plan on hunting down those more interesting early summer deep sky objects. The next night is our annual summer picnic at Mark Manner's Spot Observatory. Mark has been very gracious in inviting the club out for a picnic at his place for the last several years. Last year we had to delay it until August because of the floods. This year we are back to our normal early summer picnic.

Finally, I want to thank Jeff Gritton for his excellent program on contact and near contact binaries. His enthusiasm for the subject truly showed in his talk which was definitely a crowd pleaser. These extreme objects are some of the most interesting and amazing objects in the universe. We wish Jeff the best of luck as he begins his pursuit of a PhD at UGA this fall.

See you all at the May 19 meeting.

Dr. Spencer Buckner
President

Happy Birthday Magellan Spacecraft by Robin Byrne

This month we celebrate the launch of a spacecraft that taught us more about the planet Venus than any mission before. Because of its dense cloud cover, the surface of Venus was a mystery. As early as the late 1970's, scientists began promoting the idea of a mission to Venus that would use radar to map the surface through the clouds. An initial mission, the Venus Orbiter Imaging Radar, ended up being canceled due to budget limitations. A more cost-efficient version was proposed, called the Venus Radar Mapper, and was given the green light for construction in 1983. It was renamed Magellan in 1985. Just as Ferdinand Magellan was the first to circle Earth and map regions never before seen, this spacecraft would circumnavigate and map the surface of Venus.

As part of the cost-saving design, many of the parts used on the Magellan spacecraft were leftovers from other NASA/JPL missions. Spare parts from the Voyager missions provided the main structure and the high gain antenna used for communication and radar imaging. The medium gain antenna was leftover from the Mariner 9 mission. Under construction almost simultaneously was the Galileo spacecraft, which was going to orbit Jupiter. The computer and power systems on Magellan were originally built as back-ups for Galileo. Magellan was powered by solar panels. The lifetime of the panels would ultimately determine the lifetime of the spacecraft.

Originally, Magellan was to have launched in 1988, but the Challenger disaster delayed all launches and affected the acceptable payload designs. Magellan was supposed to be powered by a liquid fueled booster, but the new payload designs required it be changed to a solid fuel booster, which was less powerful. Meanwhile, the Galileo launch was given a higher priority, which left Magellan with a long, slow journey to Venus. On May 4, 1989, Magellan flew into space aboard the Space Shuttle Atlantis. Once in orbit around Earth, the shuttle's cargo bay doors opened, and Magellan was released and then launched free from Earth using its Inertial Upper Stage motor. The route to Venus took 15 months, during which, Magellan orbited the Sun 1.5 times before encountering Venus and going into a highly elliptical orbit in August of 1990.

The orbit of Magellan was polar, allowing it to map North-South swaths up to 17 miles wide on each pass. Due to the slow rotation of Venus, each 3 hour 15 minute orbit took Magellan over a slightly different swath of the planet. In the first eight months (one Venusian day), Magellan had mapped 84 percent of Venus' surface. For the next cycle, Magellan mapped during its route South to North. The third eight month cycle concentrated on areas that were missing, allowing Magellan to map a total of 98 percent of the Venusian surface. Many areas were mapped during all three cycles, allowing scientists to look for changes over time. Also, since the angle of imaging was different each time, they could construct 3D views of selected areas.

Once the radar mapping was complete, the next three cycles were devoted to mapping the gravitational field. By monitoring the spacecraft's motion, scientists could discern when Magellan was being affected by higher or lower gravity fields. Between the fourth and fifth cycles, a "new"

technique, called aerobraking, was used to lower Magellan's orbit. The idea of using a planet's atmosphere to provide drag and slow a spacecraft had been around for a long time, but had never been tried. Magellan was the first to actually implement this method. The lower orbit allowed even better gravity field measurements. Ultimately, Magellan mapped the gravity field of 95 percent of Venus.

By September of 1994, the solar panels were degrading to the point that Magellan had very little time left. That gave NASA enough time for one last experiment. The solar panels were rotated so that they were perpendicular to the direction of motion, and the spacecraft was lowered into an orbit that skirted the upper atmosphere of Venus. This "windmill experiment" allowed the solar panels to drag through the atmosphere while the spacecraft's engines compensated for the torque. The amount of engine use allowed scientists to determine atmospheric density at the highest altitudes. Then, on October 11 of the same year, one last command was sent to lower the orbit even further. Magellan would, over the next two days, slowly descend and disintegrate in Venus' dense atmosphere.

Among the discoveries about Venus made by Magellan, was a better determination of the age of Venus' surface. Due to the lack of many craters, it is now widely thought that the surface of Venus cannot be older than 500 million years, which may sound old, but is considered "young" from a geologic standpoint. This means that Venus experienced extensive volcanic activity during that time. Whether Venus is still volcanically active, however, is unknown, since no volcanic eruptions were imaged. However, it was found that its surface is peppered with millions of volcanoes. The images show no evidence for water being on the surface during Venus' cooler past, and no indication of Venus having plate tectonics, either. So much for Venus being Earth's "sister planet."

Right now, Venus is visible in the East during the predawn hours. If you're up early enough, take a gander at our nearest neighbor, marvel at its beauty, and remember the Magellan spacecraft, which taught us so much about this, formerly, elusive planet.

References:

Magellan Summary Sheet
<http://www2.jpl.nasa.gov/magellan/fact1.html>

Magellan (spacecraft) - Wikipedia
[http://en.wikipedia.org/wiki/Magellan_\(spacecraft\)](http://en.wikipedia.org/wiki/Magellan_(spacecraft))

Challenges of Magellan Spacecraft eHow.com By Carlos Mano
http://www.ehow.com/list_7296320_challenges-magellan-spacecraft.html

Board Meeting Minutes – April 7, 2011

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 April 7, 2011. A sign-in sheet was passed around in lieu of a roll call. Board members Dr. Spencer Buckner, Steve Cobb, Jana Ruth Ford, Bill Griswold, Dr. Donna Hummell, Santos Lopez, Kris McCall, Bob Norling, Curt Porter, Bob Rice, and Theo Wellington were present. Board member Dr. Terry Reeves was absent. A quorum being present, President Dr. Spencer Buckner called the meeting to order at 7:42 P.M.

Treasurer Bob Norling reported that the BSAS had \$2,349.23 in its regular checking account and \$407.33 in its equipment account. Dr. Spencer Buckner announced these upcoming events and star parties:

- Apr 09 - Astronomy Day at the Adventure Science Center (ASC) 11:00 A.M. to 4:00 P.M. BSAS volunteers should try to be there by 9:00 A.M. for training.
- Apr 09 - Public star party at the ASC from 8:00 to 10:00 P.M.
- Apr 30 - Private star party at mile marker 412 on the Natchez Trace Parkway.
- May 07 - Public star party at Long Hunter State Park from 8:00 P.M to 10:00 P.M.

Kris McCall announced that the ASC's Sudekum Planetarium staff were working hard to get ready for their annual Astronomy Day activities on Saturday April 09 and noted that volunteers would be much appreciated. She also commented that this event should be a lot of fun. Dr. Spencer Buckner announced that Middle Tennessee State University (MTSU) graduate student Jeff Gritton would present the April 21 public membership-meeting program on "Contact and Near-Contact Binary Stars." Dr. Buckner also announced that no BSAS-funded astronomy prizes were awarded at the 59th Middle Tennessee Science and Engineering Fair held at Austin Peay State University on March 17-19 because none of the entries were deemed to be worthy. Bob Rice, acting on behalf of the Program Committee, handed out copies of the updated membership meeting program schedule. Dr. Spencer Buckner pointed out that programs and speakers were in place through the end of February 2012.

Dr. Spencer Buckner reported that he and Curt Porter had recently met with Susan Duvenhage, the ASC's President and Chief Executive Officer, to present and discuss the BSAS' first draft of a proposed memorandum of understanding (MOU) between the two organizations. He noted that this meeting went smoothly and provided the board with copies of the ASC's first draft version of the MOU. The board then reviewed the ASC's draft with the understanding that arriving at a mutually agreed upon final MOU was still an ongoing work in progress subject to additional discussion and negotiation. The results of that review and discussion are summarized here by item number as presented in the ASC's first draft outline. (*Note: a copy of the ASC's first draft as modified during this discussion is found on page 7 - ed.*)

1. The ASC requested that the BSAS change its monthly membership meeting day from Thursday evening to another evening. The board agreed with President Buckner's recommendation to poll the membership via the internet about the day of the week on which they would prefer to meet.
- 2, 3, & 4. No changes.
5. This item that dealt with meeting locations was modified by he board to specify that if the BSAS elected to hold a potluck supper during the month of December the ASC would make either the Jack Wood Hall or the Skyline Room available for this purpose. The BSAS in turn agreed to pay the ASC \$150.00 for this service.
6. The board modified this item that specified that all meetings must be free and open to the public to exclude the December potluck supper meeting that would only be open to BSAS members.
7. The board modified this item to specify that use of the Sudekum Planetarium could be negotiated on a case-by-case basis.
8. The board decided to continue discussing this item at their next meeting to more specifically define the services to be provided by the BSAS and how the BSAS should be recognized for providing these services in official announcements.
9. The board inserted wording to better recognize the joint association between the ASC and the BSAS in providing certain star parties.
10. The copy of the ASC's draft memorandum reflecting the results of this discussion will be presented to Ms Duvenhage and other ASC executive staff for their consideration.

Since there was no further business to discuss, President Dr. Spencer Buckner declared the meeting to be adjourned at 9:10 P.M.

OFFICERS

Dr. Spencer Buckner
President

Dr. Donna Hummell
Vice-President

Bob Rice
Secretary

Bob Norling
Treasurer

Directors at Large

Steve Cobb
Jana Ruth Ford
Bill Griswold
Santos Lopez
Curt Porter
Theo Wellington
Kris McCall (ex officio)

Steve Wheeler
Newsletter Editor
wsw261@hotmail.com

Monthly meetings
are held at:



The Adventure
Science Center

800 Fort Negley Blvd
Nashville, TN 37203

Monthly Meeting Minutes – January 20, 2011

Steve Wheeler, Editor

President Dr. Spencer Buckner called the meeting to order at 7:34 P.M. in the Jack Wood Hall at the Adventure Science Center (ASC) and welcomed new members and visitors. Bob Rice, reporting for Treasurer Bob Norling, informed the membership that the BSAS had \$2,479.23 in its regular bank account and \$407.33 in its equipment account. Dr. Buckner announced these upcoming star parties:

- Apr 30 - a private members-only star party tentatively scheduled to be held at former BSAS President Mark Manner's Spot Observatory in Nunnely, TN with the mile marker 412 location on the Natchez Trace Parkway as the designated alternate site.
- May 07 - a public star party at Long Hunter State Park from 8:00 to 10:00 P.M. Dr. Buckner noted that a boy-scout troop would also be there.

Dr. Spencer Buckner reported that he and BSAS Board Member Curt Porter had recently met with the ASC's President, Susan Duvenhage, to discuss preliminary details of the proposed Memorandum of Understanding being negotiated between our two organizations and that a follow-up meeting was tentatively set for the second week of May. Dr. Buckner noted that the ASC had asked the BSAS to consider changing its membership meetings to a day other than Thursday and said that he would try to establish an online vote for the members to specify their preference.

Dr. Spencer Buckner announced that Dr. J. Allyn Smith would give an update on "Astronomy Activities at Austin Peay State University" - including the new observatory that is now virtually completed - as the program for the May 19 membership meeting. Curt Porter stated that he had purged the membership badges and asked members to pick theirs up at the end of the meeting. Mr. Porter also suggested that members keep their retrieved badges in their vehicle's glove box for convenience.

Dr. Spencer Buckner then introduced Middle Tennessee State University graduate student Jeffery Gritton who delivered the evening's program on "Contact and Near-Contact Binary Stars." Mr. Gritton explained that near-contact or semi-detached binary stars were systems in which the component stars were close enough together for one to gravitationally distort the other - sometimes into an egg shape. In contact binaries their proximity and gravitational force was strong enough for one component to pull gaseous material onto itself from the other. Mr. Gritton noted that contact and near-contact binaries typically ranged from one to ten solar masses. Both types of systems are too close together to see by optical means so that the technique of differential spectrometry is often employed for detection and analysis. Sometimes these systems - such as in CN Andromedae - can change configuration from a contact to a near-contact binary arrangement. Mr. Gritton pointed out that computer modeling of these systems could be used to calculate the orbital periods and temperature differences of the component stars among other features. He also stated that contact binaries typically show no spots around 180 degrees longitude. Mr. Gritton then described several odd systems such as Sirius (the brightest star) in which the main component has fed off the secondary component reducing it to a white dwarf and Type 1a supernovae in which the small but massive white dwarf component has accreted matter from its expanding companion and temporarily tries to re-ignite nuclear fusion. The Type 1a's are often used as standard candles for determining distances. He concluded his presentation by graciously answering questions from the audience.

Since there was no additional business to conduct, President Dr. Spencer Buckner declared the meeting to be adjourned at 8:22 P.M.

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/>



Cosmic Recount

Space Place Partners Article, April 2011
By Dr. Tony Phillips

News flash: The Census Bureau has found a way to save time and money. Just count the biggest people. For every NBA star like Shaquille O'Neal or Yao Ming, there are about a million ordinary citizens far below the rim. So count the Shaqs, multiply by a million, and the census is done.

Could the Bureau really get away with a scheme like that? Not likely. Yet this is just what astronomers have been doing for decades.

Astronomers are census-takers, too. They often have to estimate the number and type of stars in a distant galaxy. The problem is, when you look into the distant reaches of the cosmos, the only stars you can see are the biggest and brightest. There's no alternative. To figure out the total population, you count the supermassive Shaqs and multiply by some correction factor to estimate the number of little guys.

The correction factor astronomers use comes from a function called the "IMF"—short for "initial mass function." The initial mass function tells us the relative number of stars of different masses. For example, for every 20-solar-mass giant born in an interstellar cloud, there ought to be about 100 ordinary sun-like stars. This kind of ratio allows astronomers to conduct a census of all stars even when they can see only the behemoths.

Now for the real news flash: The initial mass function astronomers have been using for years might be wrong.

NASA's Galaxy Evolution Explorer, an ultraviolet space telescope dedicated to the study of galaxies, has found proof that small stars are more numerous than previously believed.

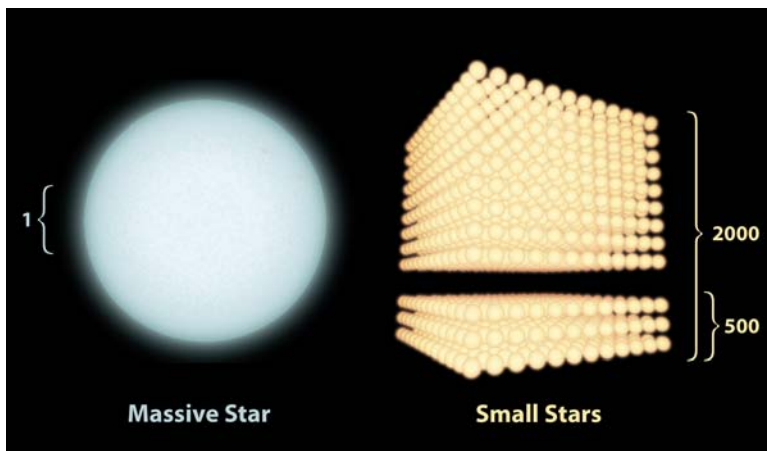
"Some of the standard assumptions that we've had—that the brightest stars tell you about the whole population—don't seem to work, at least not in a constant way," says Gerhardt R. Meurer who led the study as a research scientist at Johns Hopkins University, Baltimore, Md. (Meurer is now at the University of Western Australia.)

Meurer says that the discrepancy could be as high as a factor of four. In other words, the total mass of small stars in some galaxies could be four times greater than astronomers thought. Take that, Shaq!

The study relied on data from Galaxy Evolution Explorer to sense UV radiation from the smaller stars in distant galaxies, and data from telescopes at the Cerro Tololo Inter-American Observatory to sense the "H-alpha" (red light) signature of larger stars. Results apply mainly to galaxies where stars are newly forming, cautions Meurer.

"I think this is one of the more important results to come out of the Galaxy Evolution Explorer mission," he says. Indeed, astronomers might never count stars the same way again.

Find out about some of the other important discoveries of the Galaxy Evolution Explorer at <http://www.galex.caltech.edu/>. For an easy-to-understand answer for kids to "How many solar systems are in our galaxy?" go to The Space Place at: <http://tiny.cc/12KMa>



Astronomers have recently found that some galaxies have as many as 2000 small stars for every 1 massive star. They used to think all galaxies had only about 500 small stars for every 1 massive star.

Board of Directors Meeting Minutes Addendum

ADDENDUM

Being a copy of the first draft Memorandum Of Understanding submitted to the Barnard-Seyfert Astronomical Society's Board of Directors by the Adventure Science Center that reflects the Board's modifications made during their review on April 7, 2011.

MEMORANDUM OF UNDERSTANDING

Barnard-Seyfert Astronomical Society and Adventure Science Center

PURPOSE:

This Memorandum of Understanding (MOU) is entered into between Barnard-Seyfert Astronomical Society (BSAS) and Adventure Science Center (ASC) in order to set forth in writing specific areas of collaboration to advance the science of astronomy and further the public understanding of astronomy through experiential experiences.

THE BSAS MISSION:

The Barnard-Seyfert Astronomical Society is an organization dedicated to the advancement of the science of astronomy, the support and encouragement of amateur and professional astronomy, and the support and encouragement of the exploration and utilization of space for the advancement of civilization. The BSAS operates under the State of Tennessee Title 48 as a non-profit.

ASC MISSION:

The Adventure Science Center ignites curiosity and inspires the lifelong discovery of science. ASC is a private, not-for-profit duly qualified charitable organization under section 501(c)(3) of the Internal Revenue Code.

BSAS and ASC agree that:

1. ASC shall provide meeting space and use of a projector and screen for monthly BSAS meetings to be held the third (Monday, Tuesday, Wednesday or Thursday—tbd) of each month at no cost to BSAS.
2. Monthly BSAS meetings shall begin at 7:30 pm and end no later than 9:30 pm.
3. Other than the designated meeting space and a nearby restroom, BSAS meeting attendees shall not access closed ASC exhibit areas.
4. Due to extreme circumstances (i.e. threatening weather, extended utility outages, declared city-wide state of emergency), ASC reserves the right to close and thereby cancel a scheduled meeting on short notice.
5. BSAS may elect to have a potluck meal and program as the December meeting in which case either Jack Wood Hall or the Skyline Room would be available 6 pm until 9:30 pm. Recognizing that December is typically a busy time for private holiday events at ASC and that private holiday rentals are a source of operating income for the science center, BSAS agrees to pay to ASC \$150 as a set-up/strike fee for the required tables and chairs for 75 attendees. This event shall be booked through ASC's Private Events Department (401-5106) and is subject to ASC's private event policies.
6. BSAS meetings held at ASC shall be promoted by both organizations as free and open to the general public with the single exception of the BSAS December member potluck meal.
7. Use of the Sudekum Planetarium for the purpose of a monthly meeting shall be negotiated on a case-by-case basis.
8. In exchange for waiving the after-hours venue and equipment fees associated with the regular monthly meetings, BSAS agrees to:
 - a. Provide experienced amateur and professional astronomers to present two public programs at ASC on telescopes or other relevant astronomical topics as requested by ASC staff.
 - b. Provide experienced amateur and professional astronomers to facilitate free monthly Star Parties at ASC and other local locations as organized by ASC staff.
 - c. Recognize the ASC-BSAS Star Party partnership on their website and their Night Sky web page (at each ASC-BSAS Star Party venue) by adding "BSAS hosts monthly Star Parties in collaboration with the Sudekum Planetarium at Adventure Science Center" and a hyperlink from "Adventure Science Center" text to the Sudekum Planetarium Star Party page.
 - d. Provide experienced amateur and professional astronomers to help plan and execute an annual Astronomy Day at ASC as organized by ASC staff.
9. ASC agrees to recognize the BSAS-ASC Star Party partnership on their Star Parties web page by adding "Join the members of the Barnard-Seyfert Astronomical Society for free monthly Star Parties" and a hyperlink from "Barnard-Seyfert Astronomical Society" text to the BSAS home page.

NOTICES:

To BSAS at: Bernard-Seyfert Astronomical Society
P.O. Box 150713
Nashville, TN 37215-0713

To ASC at: Adventure Science Center
800 Ft. Negley Boulevard
Nashville, TN 37203
ATTN: Operations Director
Fax: 615-862-5178

TERM, RENEWAL AND TERMINATION:

This MOU will become effective when signed by the President of the BSAS, having been ratified by the BSAS Board of Directors, and the President and CEO of ASC.

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

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.

**BARNARD-SEYFERT
ASTRONOMICAL SOCIETY**
PO BOX 150713
NASHVILLE, TN 37215-0713

