

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

Upcoming Events

Board of Directors Meeting

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

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

Membership Meeting

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

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

Upcoming Events

Public Star Party July 25th at Long
Hunter State Park – 8:30 pm

Public Star Party August 15th at
the Warner Park Special Events
Field – 8:30 pm

Private Star Party August 22nd at
the Natchez Trace Water Valley
Overlook site (mm 418) – 7:30 pm

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Monthly Membership Meeting

July 16th, 2009
Adventure Science Center
7:30 pm



BSAS president Dr. Terry Reeves and board member & newsletter editors Steve Wheeler host a **What's Up?** tour of the summer sky. Included will be objects visible over the next few months from your own backyard.



From The President

Have you ever watched a flame war occur in an Internet new group? I have, but thankfully, it has been a few months. I want to report that I have actually seen the exact opposite lately on the TNAstronomy group on Yahoo. People have been using TNAstronomy to find other people to observe with. I think it is one of the healthiest uses of the Internet that I can imagine.

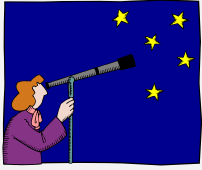
While We are on the subject of viewing in the Summer, I would like to remind you that Summer has it own set of viewing challenges. While one is not likely to freeze to death, the heat is not to be ignored. You need to make sure that you are properly hydrated. You also have to decide what to do about those blood-sucking mosquitoes. I have been reading some discussions on the Cloudy Nights web site (<http://www.cloudynights.com>) lately that have been talking about deterring them, but I am awaiting more definitive results. Some have been touting little devices that vaporize repellent and disperse it into the air (effectively like a clean-burning Citronella candle). Claims of no volatiles being deposited on telescope optics have been made, but I am not yet convinced. On the other hand, it would be nice to have something of a magic bullet against mosquitoes.

If you are close to electricity, I hear that a box fan blowing on you can actually provide quite a bit of protection. Evidently, the air movement dilutes your heat and carbon dioxide output and makes it more difficult for them to follow the trail back to you.

Like last year, we will be holding an Astronomy Retreat this September for members of the BSAS. I will be giving more details as we get closer, but I expect that they will be very close to what we did last year. Start planning to be there. Those of us who went last year had a great time.

From what I heard, the June meeting/star party was a success. I was, unfortunately, unable to attend. I had a sinus infection start that very day. Needless to say, I was not a happy camper. I would like to thank everyone who participated. This was part of a big event for Sudekum, and I am happy that we were able to help. The July meeting will be a "What's Up". Steve Wheeler and I are scheduled to give the presentation.

Dr. Terry Reeves
President



"The scientific theory I like best is that the rings of Saturn are composed entirely of lost airline luggage."

Mark Russell
(Political satirist 1932-)

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

July 2009

07/07 FULL Moon
07/15 LAST Quarter
07/22 NEW Moon
07/28 FIRST Quarter

August 2009

08/07 FULL Moon
08/15 LAST Quarter
08/21 NEW Moon
08/28 FIRST Quarter

OBJECTS VISIBLE THIS MONTH

Messier Objects:

Globular Clusters:

M3, M4, M5, M53, M68, M80

Galaxies:

M83

Outreach Update Dr. Terry Reeves, president

We had a public event at the Warner Parks Nature Center on Friday, 26. The title of the program was "Astronomy on the Cheap". There were a number of us there helping out. As it turns out, we probably had more Nature Center staff and club members there than public because of the weather. We had a good time anyway. We just had more time for the people who were there.

Also on Friday, June 26th, Steve Wheeler participated in a Stargazer Sleepover at Camp Idyllwild near Centerville, TN. While the skies did not cooperate to do an outdoor presentation with viewing, Steve gave an indoor presentation to approximately 14 children ages 9-11 and their parents on "Observing the Moon" and showed the IMAX movie *Magnificent Desolation: Walking on the Moon*. He will be doing a second event for the camp on July 24th.

We have a public star party scheduled for Saturday night, July 25, from 8:30 PM until 10:30 PM at Long Hunter State Park Visitors Center. From what I have heard, we will be able to stay later after the public has left. We have another public star party scheduled for Saturday night, August 15, from 8:30 PM until 10:30 PM at the Special Events Field at Warner Park. Finally, there is a private star party scheduled for Saturday night, August 22, at the Water Valley Overlook on the Natchez Trace (near mile marker 412).

Happy Birthday Comet Shoemaker-Levy 9 Impact

by Robin Byrne

This month we celebrate an astronomical event that was truly “out of this world.” It all began on March 24, 1993, when David Levy, Carolyn Shoemaker and Eugene Shoemaker photographed an object that would become the ninth short-period comet this team had discovered. They were using the 18 inch Schmidt telescope on Mount Palomar to conduct monthly searches for near-Earth objects. In the process, they found several comets. David Levy was an avid comet hunter and probably the most visible of the team, having turned his hobby of astronomy into a career of writing about astronomical topics in magazines and books. Eugene “Gene” Shoemaker’s name was known to many because of his years working with the Apollo astronauts, teaching them the geological knowledge they would need while on the Moon. As a geologist, his specialty was the study of impacts. He was also on the scientific teams of many lunar missions, including Ranger, Surveyor and Clementine. Carolyn Shoemaker, Gene’s wife, was a professor of Astronomy at Northern Arizona University and on the staff of Lowell Observatory. She has distinguished herself by finding more comets than any other woman, as well as hundreds of asteroids. She and Gene also studied impact craters in Australia. It was on one such expedition, years later, that Gene was killed in a car accident.

When the comet was first imaged, it had an odd, elongated shape to it, spanning roughly 50 arc seconds in length. When other observatories took more detailed images, it was discovered to be composed of several fragments strung out in a line. One of the images inspired Carolyn Shoemaker to say that it looked like “a string of pearls.” At the same time as the images became clearer, so did the nature of the comet’s orbit. Rather than being in orbit around the Sun, it was found to be in orbit around Jupiter. This was the first time a comet had been found in orbit around another planet. The comet originally was in orbit around the Sun, but came too close to Jupiter and was captured by Jupiter’s large gravitational pull. Depending on the source, the comet was either captured in the 1920’s or the 1960’s. The orbit was highly elongated, carrying the comet up to 0.33 AU’s from Jupiter at its farthest point (roughly the distance between the Sun and Mercury), but then down to within 40,000 km from the surface of Jupiter at its closest. It was on a closest approach, on July 7, 1992, that the tidal forces of Jupiter pulled the comet apart into at least 20 pieces. This event also changed the orbit so that the next closest approach, in July of 1994, would result in the comet impacting Jupiter.

The knowledge of this impact provided a rare opportunity. Never before had scientists observed an impact with more than a few seconds warning. The first order of business was to learn as much as possible about the comet. To keep track of all of the fragments, they were given letter designations, A - W. During some subsequent fragmentation, they were given a second, numerical designation, such as Q1 and Q2 for the two pieces from Fragment Q. Models of the breakup implied that the original comet was a loose conglomeration of material, rather than a solid, and was 4-5 km across. The sizes of the fragments ranged from small pieces of debris up to boulders 2 km across.

As the studies continued, it was determined that the impacts would begin on July 16, 1994 and would continue through July 22 of that year. The impact site would be in Jupiter’s southern hemisphere, and, to the dismay of Earth bound observers, the impacts would occur on the side of Jupiter facing away from Earth. However, there were two consolations. The impacts would be very close to Jupiter’s limb, and would rotate into view from Earth in less than half an hour after impact, and, there were several spacecraft available to observe the impacts directly, including the Galileo spacecraft, which was on its way to Jupiter, and Voyager 2, which was well on its journey away from Jupiter. Other orbiting observatories, including the Hubble Space Telescope and the International Ultraviolet Explorer, were also ready to observe the impact at a variety of wavelengths. An international team of astronomers coordinated their observing efforts and pledged to share all of their findings within 6 months of the impacts.

The impacts began with Fragment A on July 16, 1994 at 20:11 Universal Time and ended with Fragment W on July 22 at 8:06 Universal Time. The impacts were estimated to be at speeds up to 60 km/s. Observing the first impact, the Galileo spacecraft detected a fireball almost 20x hotter than Jupiter’s normal atmospheric temperatures, which rose to over 3000 km from Jupiter’s surface, and, as it expanded, cooled significantly in less than a minute. From Earth, the fireball could be seen rising above Jupiter’s limb. Then, as the impact site rotated into view, astronomers were surprised by what they saw: a large dark spot, easily visible in even small telescopes. As the days passed, more impacts occurred and more spots were formed. The largest impact occurred on July 18 from Fragment G, creating a dark spot over 12,000 km across (about the size of Earth). The total energy unleashed on Jupiter from the 21 impacts was more than the equivalent of exploding all of the nuclear weapons on Earth simultaneously. It brought home how vulnerable Earth really is to the threat of a large impact.

For the next 2 months, the dark spots were easily visible on Jupiter. Their arrangement, in a row across the face of the planet, also helped to explain some crater chains that had been observed on Ganymede and Callisto. These features were originally thought to have been due to a large impact, with ejected material causing secondary impacts. However, that should result in a string of small craters leading to one large crater, which has been observed on the Moon. But the craters were all relatively equal in size on Jupiter’s satellites. It is now thought that they were the result of Jupiter breaking up an asteroid or comet, and the string of fragments colliding with the moons. It also illustrated the role Jupiter plays in “cleaning up” the solar system, by gravitationally pulling in much of the debris that orbits the Sun. Jupiter experiences 2000 - 8000x as many impacts as Earth due to its gravitational dominance. This process tremendously reduces the likelihood of something colliding with other planets, including Earth.

I vividly remember observing the dark spots on Jupiter. Adam and I had just recently purchased our 10 inch Dobsonian telescope. The weather had not been cooperative - late afternoon thundershowers were far too predictable, and Jupiter set soon after it got dark. Finally, the weather cooperated and we saw those spots. They were amazing! Flat black, like nothing we had ever seen before. It was a sight I will always cherish. More recently, I got the opportunity to meet and talk with Carolyn Shoemaker at this year’s Southern Star event. She recalled how they were so busy dealing with the press that they only saw other people’s images during the entire impact period. It wasn’t until after all the excitement was over that they got to look through a telescope and see the spots for themselves. Carolyn said that seeing Jupiter with her own eyes was when it all became “real.”

With Jupiter being one of the highlights of the International Year of Astronomy, it seems appropriate that we should remember some of the historical events in that planet’s history: Galileo’s first observations of Jupiter through a telescope 400 years ago; the spacecraft, from Pioneer to Voyagers 1 and 2 to Galileo, which gave us our best up-close images of the planet; and an amazing week 15 years ago, when the whole world watched Comet Shoemaker-Levy 9 make an impact that is still talked about today.

References:
Comet Shoemaker-Levy Background
<http://www2.jpl.nasa.gov/sl9/background.html>

Comet Freight Train to Collide with Jupiter
<http://www2.jpl.nasa.gov/sl9/back1.html>

Comet Team Biographies
<http://www2.jpl.nasa.gov/sl9/back5.html>

Update on SL9/Jupiter Collision
<http://www2.jpl.nasa.gov/sl9/news49.html>

June 2009 Board Meeting Minutes

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 June 4, 2009. A sign-in sheet was circulated in lieu of a roll call. Board members Dr. Spencer Buckner, Jana Ruth Ford, Bill Griswold, Dr. Donna Hummell, Bob Norling, Curt Porter, Dr. Terry Reeves, Bob Rice, and Steve Wheeler were present. Board members Tony Campbell, Kris McCall, and Theo Wellington, and were absent. A quorum being present, President Dr. Terry Reeves called the meeting to order at 7:39 P.M.

Treasurer Bob Norling reported that the BSAS' bank balance was \$2,193.32 plus \$150.00 in a newly established account for equipment donations. Dr. Terry Reeves reported that the BSAS' annual fee to continue it's membership in the Astronomical League (A.L.) would soon become due and asked for a decision to either renew or discontinue that membership. Dr. Spencer Buckner moved that the BSAS renew this membership and Steve Wheeler seconded his motion that subsequently passed by a unanimous voice vote without additional discussion. Bill Griswold stated that the BSAS had approximately 90 members and that he would provide a complete list to Mike Benson, the BSAS' A.L. Coordinator.

Dr. Terry Reeves reminded the board about these upcoming public outreach and other events:

- Jun 18th – Joint meeting with members of the Southeastern Planetarium Association at Mark Manner's Spot Observatory,
- Jun 26th – Public binocular star party (Astronomy on the Cheap) at the Warner Parks 8:00-9:30 P.M.,
- Jul 16th – Membership meeting program: "What's Up (in the evening sky)" by Steve Wheeler,
- Jul 25th – Public star party at Long Hunter State Park 8:30-10:30 P.M.,
- Aug 15th – Public star party at Edwin Warner Park 8:30-10:30 P.M.,
- Aug 20th – Membership meeting program: "Free Astronomy Software" by Randy Smith, and
- Aug 22nd – Private star party at the Water Valley Overlook off the Natchez Trace Parkway.

Steve Wheeler informed the board that he had been invited back as a presenter/telescope provider for Camp Idyllwild's youth-oriented astronomy educational session this July.

Jana Ruth Ford reported that the BSAS was one of eight member clubs selected by NASA's Night Sky Network to hand out public response cards at up coming outreach events. Dr. Terry Reeves commented that the BSAS' annual astronomy retreat was scheduled for September 11-12 at Mark Manner's Spot Observatory and noted that he would coordinate the planning details with Mark. Dr. Reeves also reminded the board to start thinking about nominations for officers and directors for 2010. There being no further business to discuss, Dr. Reeves declared the meeting to be adjourned at 8:10 P.M.

OFFICERS

Dr. Terry Reeves
President

Dr. Spencer Buckner
Vice-President

Bob Rice
Secretary

Bob Norling
Treasurer

Directors at Large

Tony Campbell
Jana Ruth Ford
Dr. Donna Hummel
Curt Porter
Theo Wellington
Steve Wheeler
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

June 2009 Activity Report (In lieu of Monthly Meeting Minutes)

Bob Rice, Secretary

Members of the Barnard-Seyfert Astronomical Society met at member Mark Manner's Spot Observatory in Spot, Tennessee on the evening of June 18, 2009 to join members of the Southeastern Planetarium Association for an informal supper and a later telescope observing session. This activity was in lieu of our regular monthly meeting and no business was conducted. Fortunately, the weather was clear even though the high humidity put everyone's dew heaters to the test. Our sincere thanks go out to Mark and Anne for their wonderful hospitality.

The following is Sudekum Planetarium director Kris McCall's report on the event:

"Delegates who attended the 2009 conference of the Southeastern Planetarium Association came from across the U.S. and around the world. The Great Plains, Pacific, Rocky Mountain, and Southwestern planetarium associations joined SEPA for this meeting. There were also guests from England, Portugal, the Netherlands, Germany, New Zealand, and large contingent from Japan.

While some delegates chose a night on the town in Nashville instead of going to Spot Observatory, the 75 who made the trek for BBQ in Bucksnort had a wonderful time. Considering the high temperatures and humidity, it was a relaxing evening for all, culminating in surprisingly nice observing. Many, MANY thanks to the BSAS members who were able to make the drive and set up equipment for the enjoyment of our world class visitors. They were suitably impressed.

Extra special thanks to Mark and Anne for their willingness to let SEPA invade their sanctuary and share their love of astronomy with like-minded folks."

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/>



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)
- \$15** Student*

* To qualify, you must be 21 or younger & enrolled in an accredited institution.

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 Joe Boyd at (615) 386-3134.

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

