

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

Upcoming Events

Board of Directors Meeting

March 4th at the Cumberland Valley Girl Scout Council Building – 7:30 pm

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

Membership Meeting

March 18th at the Adventure Science Center – 7:30 pm

April 15th at the Adventure Science Center – 7:30 pm

Star Parties

March 13th – BSAS Messier Marathon – see President's Message for details.

March 20th - BSAS Public Star Party at Warner Park Special Events Field – 8 -10:00 pm

March 26th - BSAS Public Star Party at Bells Bend Outdoor Center - 8:00 -10:00pm

April 10th – RAIN DATE for BSAS Messier Marathon

April 17th - BSAS Public Star Party at Sudekum Planetarium – 8:00 -10:00pm

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Monthly Membership Meeting

Thursday, March 18, 2010
Adventure Science Center
7:30 pm

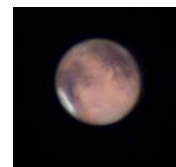


Image: Mark Manner

Sudekum Planetarium Director Kris McCall will present an extended version of **Mars Update** featuring an overview of how our views on Mars have changed over the years - from H.G. Wells and Percival Lowell to the Mars Exploration Rovers Spirit and Opportunity. Also discussed will be location of Mars in the current night sky and the current status of various spacecraft working at Mars and what they've discovered, and what other spacecraft have been or will be doing on Mars.

From The President

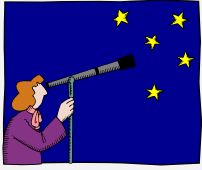


Greetings from the president of the BSAS.

Well, we finally managed to hold a public star party! I was beginning to feel like the primary duty of the president was to cancel star parties and that is not a pleasant duty. Saturday February 20 began with gorgeous blue skies and, while they didn't remain completely clear into the evening, they were more than clear enough to hold the star party at Shelby Bottoms Park. About half a dozen telescopes showed up and I estimate there were around 30 members of the public at the peak so probably around 50 or 60 attended during the whole evening. Given the non-ideal sky conditions and the cold temperatures (my toes were pretty much frozen despite two pairs of socks), I was pleased with the turnout. The views were mostly of the usual crowd pleasers Mars, the Moon, Saturn and the Orion Nebula but a few fainter clusters were found by several of the telescope operators. Let's hope that this marks the end of our bad luck with star parties and begins a streak of clear nights for them instead.

Our next star party is the Messier Marathon at Mark Manner's Spot Observatory near Spot, TN (about 50 miles west of Nashville on I-40) on the evening of Saturday March 13 and morning of Sunday March 14. Mark has an excellent website with his own fantastic astrophotos as well as pictures of his equipment and directions at www.spotastro.com. The Messier Marathon is an attempt to view all 110 Messier objects in a single night. The best telescope to use is a 10" Dobbs but go-to telescopes are allowed (you're competing against time, not each other). Try to arrive well before dusk to give yourself time to get set-up and be ready to start viewing by dusk. Mark has graciously allowed us to use his property so please be respectful of it. He has a small guest house with restrooms and you can use it to warm up in if you take a break from viewing. Bring lots of fluids (no alcohol, please) and some snacks to munch on through the night. If the skies don't cooperate, an announcement will be sent out over the TN Astronomy news group and posted on the BSAS website. Our rain/cloud out date is April 10 and it will also be at Mark Manner's Spot Observatory.

Continued on Page 2



"But I'm the only one who can paint the moon, because I'm the only one who knows whether that's right or not."

Alan Bean
(Captain, USN, Ret)
Lunar Module Pilot,
Apollo 12

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

March 2010

03/07 LAST Quarter
03/15 NEW Moon
03/23 FIRST Quarter
03/30 FULL Moon

April 2010

04/06 LAST Quarter
04/14 NEW Moon
04/21 FIRST Quarter
04/28 FULL Moon

OBJECTS VISIBLE THIS MONTH

Messier Objects:

Open Clusters:

M41, M44, M46, M47, M48, M50,
M67, M93

Caldwell Objects:

C25 - The Intergalactic Wander
C32 - The Whale Galaxy
C52 - The Spindle Galaxy
C59 - The Ghost of Jupiter

From the President, cont.

The next public star party will be at the special events field at Warner Park on Saturday March 20. Daylight Savings Time will already be in effect then so the star party will start at 8:00pm and go until 10:00pm. If you are planning on bringing a telescope, be sure to arrive early as the access road to the field will be blocked off once the public starts to arrive and you'll have to carry your gear from the parking lot. Let's all hope for clear skies and a large turn-out.

Finally, I want to encourage everyone to invite a friend to the March 18 public meeting of the BSAS. Sudekum Planetarium Director Kris McCall will be giving us an extended version of the Mars Update program with all the latest from Mars. If you know families with kids, especially invite them. I plan on offering bonus points to my astronomy class at APSU to encourage my students to come. I would like to fill the planetarium but I'll be more than happy if we can just half fill it. See you in March.

Dr. Spencer Buckner
President

Happy Birthday Simon Newcomb

by Robin Byrne

This month we celebrate the life of a man whose contributions helped to make astronomy a more accurate science. On March 12, 1835 in the town of Wallace, Nova Scotia in Canada, Simon Newcomb was born to Emily Prince and John Burton Newcomb. Simon's father was a school teacher who traveled throughout Canada to various schools, and was Simon's primary source for his education until his apprenticeship in New Brunswick.

Newcomb's apprenticeship at the age of 16 was with an herbalist, Dr. Forshay. It was supposed to last for 5 years, but Newcomb soon realized that Dr. Forshay was a fraud. After only two years apprenticeship, Newcomb left to join his father, who was now in the United States. After walking 120 miles to Calais, Maine, Newcomb worked for his passage on a ship to Salem, Massachusetts. From there, Simon and his father traveled to Maryland.

In Maryland, Newcomb worked for two years as a teacher. At the same time, he endeavored to teach himself a variety of topics in which he was interested, including: economics, religion, astronomy, and mathematics. In 1856, with a new job in Washington, D. C. as a math tutor, Newcomb found himself visiting the Smithsonian Institute. There he met the director, Joseph Henry, who became a good friend and mentor. The books available from the Institute helped Newcomb with his independent studies even more.

It was through Joseph Henry that Newcomb heard about a position with the Coast Survey and Nautical Almanac in Cambridge, Massachusetts. The job would be that of "computer," which meant that he would be in charge of manually calculating a variety of values for the Almanac. In 1857, Newcomb officially joined the Nautical Almanac Office. At about the same time, he began taking classes at the Lawrence Scientific School of Harvard University, from which he received a Bachelors degree in 1858. One of Newcomb's areas of research was a study of the orbits of asteroids with the goal of determining their place of origin.

In 1861, with the climate in America during the period prior to the Civil War heating up, many employees at the Nautical Office left to move to Confederate states. One of the subsequent vacancies allowed Newcomb to become Professor of Mathematics and Astronomy at the U. S. Naval Observatory. Here, he worked on measuring planet positions to be used as a navigational aid. As his career blossomed, so did Newcomb's personal life, and two years later he married Mary Caroline Hassler.

From 1861 to 1871, Newcomb spent most of his time studying the motions of planets. Under his supervision, the Naval Observatory had built a 26-inch refractor, which was the largest refractor in the United States at that time. Using this supreme instrument, Newcomb endeavored to improve astronomers' ability to predict the positions of planets and moons by including in their calculations the gravitational influences of other bodies in the solar system.

In 1870, Newcomb had the opportunity to visit Paris to observe a total eclipse of the Sun. It was here that he gained access to lunar observations dating back to 1672. This data allowed Newcomb to greatly improve calculations for the Moon's position. His trip also included an element of danger, for he arrived in time for the fall of Paris during the Franco-Prussian War. Newcomb was, luckily, able to escape from Paris before the rioting had reached the Paris Observatory. Despite the drama, Newcomb's trip was certainly worthwhile, for his work on the Moon's motion (as well as later work on the positions of Uranus and Neptune) led to his receipt of the Gold Medal from the Royal Astronomical Society in 1874.

In 1875, Newcomb was offered the directorship of the Harvard College Observatory. Newcomb declined, knowing that he was more of a computational astronomer than an observational astronomer. Two years later, a job came along that was much more appropriate: Director of the Nautical Almanac Office. This position allowed Newcomb to work on one of his major

achievements, which was to recalculate all of the major astronomical constants. At about the same time, he also took a position as Professor of Mathematics and Astronomy at John Hopkins University. It was with one of his John Hopkins colleagues, A. M. W. Downing, that Newcomb accomplished his goal of refining the astronomical constants. Part of their task was to improve upon observations of the positions of the Sun, Moon, planets and bright stars. The other component involved developing the formulae to account for how the gravity from each planet causes perturbations in the motions of the other planets. Newcomb worked on this project for close to 20 years. In 1896, at a conference on standardization held in Paris, it was agreed that Newcomb's values would become the standard. In 1950, at another conference, Newcomb's constants were adopted as the international standards.

One of the complications encountered by Newcomb while measuring the astronomical constants was that there was not an accurate value for the speed of light. In 1878, Newcomb began working on an experimental determination of light's speed. At this time, he began corresponding with Albert Michelson, who was also working on a similar project. Michelson assisted Newcomb with an initial experiment in 1880, which involved sending a beam of light between instruments located at Fort Myer and the Naval Observatory. Michelson left to pursue his own experiments, and published his results first, in 1880. Newcomb performed a second experiment, with instruments located at the Naval Observatory and at the Washington Monument. The value Newcomb established was different from Michelson's, and Michelson later revised his value to one closer to Newcomb's.

Newcomb continued to work on a variety of projects, including: a statistical analysis related to number theory, a measurement of Earth's rigidity, and a study to better measure the rate of precession of Earth's axis. He wrote several books, covering topics from economics to astronomy to a work of science fiction, titled "His Wisdom the Defender," as well as a memoir. Many of his astronomy books were written for the general public, and were quite popular. Newcomb was involved in several professional societies, including being a founding member, and first president (1899-1905), of the American Astronomical Society.

In 1897, Newcomb retired from the U. S. Naval Observatory with a rank of Rear Admiral, having never been involved with any military activity. In 1908, Newcomb was diagnosed with cancer of the bladder. With his death rapidly approaching, Newcomb spent his final months finishing his book, "The Motion of the Moon," which was the culmination of most of his life's work. Simon Newcomb died July 11, 1909 and was buried in Arlington National Cemetery. In attendance at the funeral was President William Howard Taft.

Simon Newcomb was a, largely, self-taught man. His devotion to the measurement of astronomical constants is, by far, his most lasting legacy. Look in the back of any astronomy text book or in any ephemeris, and you will find a page listing a variety of constants. Open a computer program or web page designed to plan your evening's viewing, or use a GoTo telescope to find an object of interest, and the constants used to compute those locations are based upon the work accomplished by this month's honoree: Simon Newcomb. We owe him much.

References:
Simon Newcomb - Wikipedia
http://en.wikipedia.org/wiki/Simon_Newcomb

Simon Newcomb (1835 - 1909)
<http://www.physics.csbsju.edu/astro/newcomb/SNewcomb.html>

Newcomb biography by J J O'Connor and E F Robertson
<http://www-history.mcs.st-and.ac.uk/Biographies/Newcomb.html>

Board Meeting Minutes – February 4th, 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 February 4, 2010. Board members Dr. Spenser Buckner, Bill Griswold, Dr. Donna Hummell, Bob Norling, Curt Porter, Dr. Terry Reeves, and Bob Rice were present. Board members Tony Campbell, JanaRuth Ford, Santos Lopez, Kris McCall, and Theo Wellington were absent. A quorum being present, President Dr. Spenser Buckner called the meeting to order at 7:31 P.M.

Treasurer Bob Norling reported that the Society had \$2,039.41 in its regular checking account and \$150.00 in its equipment account. Dr. Spenser Buckner noted that the BSAS might add more to its equipment account at a later time. Curt Porter moved that for future club sales of the RASC's Observer's Handbook and Kalmbach Publishing's Deep Space Mysteries Calendar, purchasers be required to put down a ten dollar deposit to order a handbook and a five dollar deposit to order a calendar. Bill Griswold seconded this motion and, following a brief discussion, it carried by a unanimous voice vote.

Dr. Spenser Buckner called attention to these upcoming star parties and events:

- Feb 13 – Private star party @ mile marker 435.5 on the Natchez Trace Parkway
- Feb 20 – Public star party @ Shelby Bottoms Park from 7:30 – 9:30 P.M.
- Mar 13 – Messier Marathon for club members @ Mark Manner's Spot Observatory
- Mar 20 – Public star party @ the Warner Parks from 8:00 – 10:00 P.M.

Dr. Spenser Buckner noted that he would be in Washington during the February 13 private star party and asked for a volunteer to issue a "go or no-go" decision for that event depending upon the weather; Terry Reeves agreed to do so. Dr. Buckner also noted that telescope-bringing members should use a different entrance than the general public at the February 20 public star party at Bells Bend Park and suggested that a map showing this be included in the Eclipse newsletter and/or the BSAS' website. In addition, he noted that board member Santos Lopez was investigating getting signage from his employer to mark these locations.

Dr. Spenser Buckner reported that the Adventure Science Center (ASC) would soon be engaged in its annual Caper fundraising event, a costume party and silent auction, and suggested that the BSAS consider donating a star party as a prize for that activity. Following a brief discussion, Bill Griswold moved that the BSAS make such a donation and Dr. Donna Hummell seconded this motion that passed by a unanimous voice vote. Dr. Buckner also announced that David Lipscomb was looking for judges to evaluate high school and middle school astronomy-related entries in their upcoming first Science Olympiad.

Dr. Spenser Buckner announced that Nashville would again be a participating city in the World Wildlife Fund's Earth Hour on March 27 at 8:30 P.M. At this time all participating cities around the world will turn out as many lights as they can to show their support for reducing light pollution. Dr. Buckner said that he would contact Kris McCall to see about having a star party at the ASC during Earth Hour as we did in 2009. He also said that he would discuss plans for Astronomy Day with her.

Dr. Spenser Buckner said that he would like to eliminate the 21-year-old age limit for reduced-rate student memberships so that full-time college age and graduate students would be included. Following considerable discussion, Curt Porter moved that this be done and that the student rate be reduced from \$15.00 to \$12.00. Bob Norling seconded this motion that subsequently passed by a unanimous voice vote. Bill Griswold announced that he would make the appropriate changes on the BSAS' membership application form.

Secretary Bob Rice announced that he would be absent from the February 18 membership meeting and asked for someone else to take the minutes. Dr. Buckner said that they would find someone to do that. Bill Griswold announced that long time BSAS member Ms Sykes DeWitt had recently died and suggested that her honorary subscription to the Eclipse newsletter be extended to her daughter via email. Ms DeWitt was the widow of former BSAS member Jack DeWitt who first bounced a radar signal off the Moon in 1946 while a Lieutenant Colonel in the U.S. Army Signal Corps and later served as president of Nashville's WSM television station for many years. The board unanimously agreed to this extension. Mr. Griswold also noted that with the additional changeover of regular Eclipse contributor Robyn Byrne's copy, all newsletters were now being sent out via email thus saving the Society quite a bit in postage.

Curt Porter observed that the board should make a concerted effort to locate and recover all elements of the BSAS' history going back to its establishment in 1928 to preserve its "organizational memory." The board agreed and discussed this topic at length with several names being mentioned as possible contacts. Bill Griswold suggested that the club should start using sign-in sheets again for board and membership meetings. Since no electronic templates were available for the sign-in sheets, Dr. Spenser Buckner suggested that it be reconstructed from scratch.

Since there was no further business to discuss, President Buckner declared the meeting adjourned at 8:27 P.M.

OFFICERS

Dr. Spenser Buckner
President

Dr. Donna Hummell
Vice-President

Bob Rice
Secretary

Bob Norling
Treasurer

Directors at Large

Tony Campbell
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 – February 18, 2010

Dr. Spencer Buckner, President

Dr. Spencer Buckner called the meeting to order at 7:35pm and welcomed all those in attendance. Treasurer Bob Norling reported that the club had \$2099.41 in its bank account and \$150 in the equipment fund. Dr. Buckner then announced the following public meetings:

- Public Star Party Saturday February 20 at Shelby Bottoms Park from 7:30 – 9:30pm
- Private Star Party (Messier Marathon) Saturday/Sunday March 13/14 at Mark Manner's Spot Observatory from dusk to dawn.
- Rain/cloud out date of April 10/11, also at Mark Manner's Spot Observatory from dusk to dawn
- Public Star party Saturday March 20 at Warner Parks' special events field from 8:00 – 10:00pm
- Public Star Party Friday March 26 at Bells Bend Park from 8:00 – 10:00pm
- Although not a BSAS star party, Dr. Buckner mentioned the Tennessee Spring Star party (TSSP) for April 16 – 18 at Fall Creek Falls State Park. Attendees are responsible for their own food and lodging but the Fall Creek Falls State Park was offering a star party package deal at the lodge.
- It was mentioned that Middle Tennessee State University was resuming their 1st Friday's astronomy public event beginning on March 5. This is another non-BSAS event which BSAS members have helped out with in the past.

Dr. Buckner announced that the program for the March meeting would be a Mars Update presented by Kris McCall using the state-of-the-art Sudekum Planetarium. As there was no further business, Dr. Buckner introduced the evening's speakers: club member Steve Wheeler and former president D. Terry Reeves who presented a program on "What's Up". Steve Wheeler went first and showed the audience a number of objects viewable with binoculars. Steve displayed a pair of binoculars and discussed how a simple tripod attachment piece can be used to mount a pair of binoculars onto a tripod to help steady the view. Included in the objects Steve showed were the Pleiades (M45), The Hyades, The Beehive (M44) and the Orion Nebula (M42).

Mr. Wheeler then turned the program over to Dr. Terry Reeves who showed those in attendance a number of more challenging objects which require a telescope to view. Dr. Reeves showed the audience how to find objects using the "star hop" technique. He went through a number of the clusters in Auriga and Gemini including M35, M 36, M37 and M38. He showed the lonely winter globular cluster M79 in Lepus and then moved to galaxies in Leo and finally finished with a few of the galaxies in Virgo.

After the presentation, Dr. Reeves and Steve Wheeler entertained a few questions from the audience. The evenings' events concluded with Kris McCall giving the audience an outline of the March program.

BSAS Affiliations

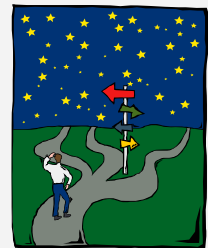
The Astronomical League
<http://www.astroleague.org/>



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



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



Flipping the Lights on Cosmic Darkness

Space Place Partners Article, February 2010

Exploring the universe is a bit like groping around a dark room. Aside from the occasional pinprick of starlight, most objects lurk in pitch darkness. But with the recent launch of the largest-ever infrared space telescope, it's like someone walked into the room and flipped on the lights. Suddenly, those dark spaces between stars don't appear quite so empty. Reflected in the Herschel Space Observatory's 3.5-meter primary mirror, astronomers can now see colder, darker celestial objects than ever before—from the faint outer arms of distant galaxies to the stealthy “dark asteroids” of our own solar system.

Many celestial objects are too cold to emit visible light, but they do shine at much longer infrared wavelengths. And Herschel can observe much longer infrared wavelengths than any space telescope before (up to 672 microns). Herschel also has 16 times the collecting area, and hence 16 times better resolution, than previous infrared space telescopes. That lets it resolve details with unprecedented clarity. Together, these abilities open a new window onto the universe.

“The sky looks much more crowded when you look in infrared wavelengths,” says George Helou, director of the NASA Herschel Science Center at Caltech. “We can't observe the infrared universe from the ground because our atmosphere blocks infrared light, and emits infrared itself. Once you get above the atmosphere, all of this goes away and suddenly you can look without obstruction.”

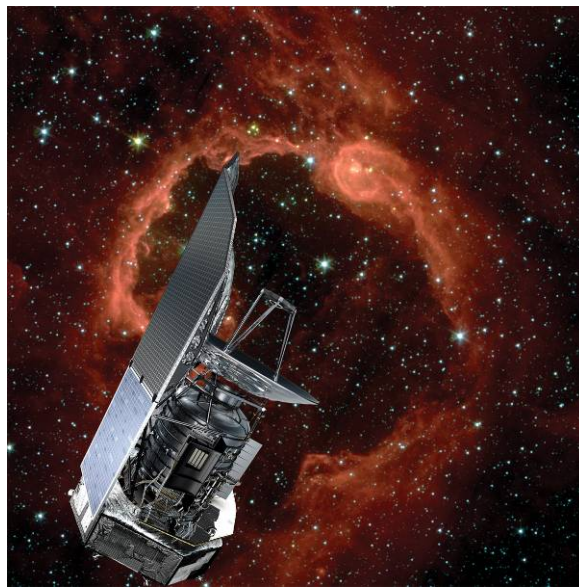
Herschel launched in May from the Guiana Space Centre in French Guiana aboard a European Space Agency Ariane 5 rocket. Since then, it has expanded the number of distant galaxies observed at far infrared wavelengths from a few hundred to more than 28,000. And with the instrument testing and system check-out phases finally completed, the discoveries are only now beginning.

Beyond simply imaging these dark objects, Herschel can identify the presence of chemicals such as carbon monoxide and water based on their spectral fingerprints. “We will be able to decipher the chemistry of what's going on during the beginnings of star formation, in the discs of dust and gas that form planets, and in the lingering aftermath of stellar explosions,” Helou says.

And those are just the expected things. Who knows what *unexpected* discoveries may come from “flipping on the lights?” Helou says “we can't wait to find out.”

Herschel is a European Space Agency mission, with science instruments provided by a consortium of European-led institutes and with important participation by NASA. See the ESA Herschel site at sci.esa.int/science-e/www/area/index.cfm?fareaid=16. Also, see the NASA sites at herchel.jpl.nasa.gov, www.herschel.caltech.edu, and www.nasa.gov/mission_pages/herchel. Kids can learn about infrared light by browsing through the Infrared Photo Album at The Space Place, spaceplace.nasa.gov/en/kids/sirtf1/sirtf_action.shtml.

This article was provided courtesy of the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



Caption:

The Herschel Space Observatory has 3.5-meter primary mirror, allowing astronomers to see colder, darker celestial objects than ever before.

MEMBER Contributions



The Eskimo Nebula (NGC 2392)

The Eskimo Nebula (NGC 2392), also known as the Clownface Nebula, is a bipolar double-shell planetary nebula. It was discovered by astronomer William Herschel in 1787. The formation resembles a person's head surrounded by a parka hood. It is surrounded by gas that composed the outer layers of a Sun-like star. The visible inner filaments are ejected by strong wind of particles from the central star. The outer disk contains unusual light-year long orange filaments.

Source: Wikipedia

Imaged by **Mark Manner** from his observatory near Spot, Tennessee. For detailed information on this and other images, visit Mark's web site at <http://www.spotastro.com>.

The Horsehead Nebula (Barnard 33)

The Horsehead Nebula, a dark nebula in the constellation Orion, is one of the most identifiable nebulae because of the shape of its swirling cloud of dark dust and gases, which is similar to that of a horse's head. The red glow originates from hydrogen gas predominantly behind the nebula, ionized by the nearby bright star Sigma Orionis. The darkness of the Horsehead is caused mostly by thick dust, although the lower part of the Horsehead's neck casts a shadow to the left. Streams of gas leaving the nebula are funneled by a strong magnetic field.

Source: Wikipedia

Imaged by **Steve Wheeler** from his home near Franklin, Tennessee. For detailed information on this and other images, visit Steve's web site at <http://sgto.home.comcast.net>.



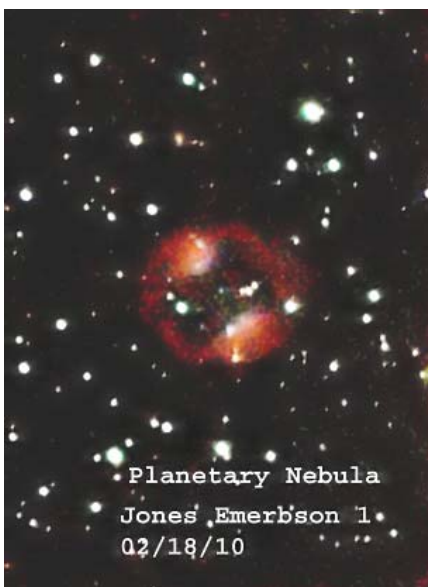
Jones-Emberson 1 (PK164+31.1)

Jones-Emberson 1 (PK 164+31.1) is a 14th magnitude planetary nebula in the constellation Lynx at a distance of 1600 light years. It is a larger planetary with low surface brightness. The 16.8-magnitude central star is a very blue white dwarf.

Discovered in 1939 by R. Jones and R. Emberson, it's "PK" designation comes from the names of Czechoslovakian astronomers Luboš Perek and Luboš Kohoutek, who in 1967 created an extensive catalog of all of the planetary nebulae known in the Milky Way as of 1964. The numbers indicate the position of the object on the sky. ("PK 164+31.1" basically represents the planetary nebula that when using the galactic coordinate system has a galactic longitude of 164 degrees, a galactic latitude of +31 degrees, and is the first such object in the Perek-Kohoutek catalog to occupy that particular one square degree area of sky).

Source: Wikipedia

Imaged by **Tom Murdic**. For detailed information on this and other images, see Tom's image gallery at the tnastronomy Yahoo group.



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**
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