



# ECLIPSE



*The Newsletter of the Barnard-Seyfert Astronomical Society*

Celebrating our 77th Year

July 2005

**The Membership meeting will be held on July 21, 2005 at the Adventure Science Center at 7:30 pm. The speaker will be Dr. Charles McGruder**

Dr. Charles H. McGruder III obtained his B.S. in Astronomy from the California Institute of Technology and his Ph.D. from the University of Heidelberg in Germany. He has taught at the University of Nigeria and at Fisk University. For nine years he was the Chair of the Department of Physics and Astronomy at Western Kentucky where he is now the William McCormack Professor of Physics. He is the Past President of the National Society of Black Physicists.

Dr. McGruder's primary research interests are extrasolar planets and gamma-ray bursts. He involves students at Western Kentucky in world class astronomical research projects such as the Search for Extrasolar Planets, the Optical Detection of Gamma-ray Bursts, and the Monitoring of Active Galactic Nuclei. He is also involved in promoting astronomy in third-world countries. His July presentation for BSAS will include a discussion of the ongoing work in astronomy in southern Africa, including Rwanda. Currently, Dr. McGruder is working to obtain at least a meter-class, research-grade telescope for the University of Rwanda. He and his wife, Chinyere, a professor at Austin Peay State University, are teaching there during the summer.

## FROM THE PRESIDENT

by John Harrington, President

I'd like to focus on space exploration in this month's column. But first, I have heard from a couple of BSAS members who are having a hard time logging on to the BSAS website or sometimes miss their issues of *The Eclipse*. If you fall into either of those categories (but manage to receive this issue!), please drop an e-mail to me at [harringtonjo@bfusa.com](mailto:harringtonjo@bfusa.com) so we can investigate the problem.

Turning to space exploration, I note with sadness that the Cosmos 1 mission, designed to loft the first solar sail into space, apparently failed to reach orbit a few days ago. A solar sail is in essence a spacecraft propelled by the gentle but continuous pressure of sunlight (!). The mission was conducted on a shoestring budget of only \$4 million and its failure is apparently attributable to the cold war-surplus Russian submarine-launched ballistic missile used to launch it. The mission's failure is especially sad, since it was a great example of "turning swords into plowshares" and since the prime movers behind Cosmos 1 were The Planetary Society and Ann Druyan, Carl Sagan's widow. Had it succeeded, Cosmos 1 would probably have been among the brightest objects in the night sky during its brief lifetime, initially shining at magnitude -1 or perhaps even brighter.

Cosmos 1 marked only the latest in a line of cut-price space missions that have proven unsuccessful. Many of you will remember Beagle 2, a British planetary probe that hitched a ride with the European Space Agency's Mars Express mission but apparently crash-landed on Mars. Beagle 2's total budget was a much higher \$61 million, but that is still a relatively small amount of funding for a planetary probe. The net result was a mission lacking redundant systems to avoid failure and without sufficient telemetry to let mission scientists and engineers know exactly what went wrong.

And of course, even NASA saw several low-cost planetary probes fail in recent years. Both the Mars Polar Lander and Mars Climate Observer space probes were built as part of NASA's "better, faster, cheaper" initiative

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during the 1990s, although the combined budget for the two missions was about \$328 million. That's a lot of money, but \$164 million per mission is still somewhat modest by historical standards—and both failed.

My point is simply this—space exploration is hard and low-cost missions (especially planetary probes) still have a tendency to fail. This makes the occasional low-cost successes, such as SpaceShipOne's repeated sub-orbital flights, all the more impressive. But it also emphasizes the need for NASA, ESA, and the world's other space agencies not to underestimate the difficulty of getting spacecraft into orbit and equipping them to survive in the harsh conditions of space, especially if they are headed for other planets. The recent successes of NASA's Mars Rovers (combined cost \$820 for the two missions) and ESA's Mars Express (\$360 million) underline the fact that serious planetary exploration still costs very substantial sums.

Hopefully NASA will be able to add another successful mission to its scorecard this coming July 4<sup>th</sup>, when the Deep Impact mission (\$330 million) sends a probe to impact Comet Tempel 1. Here in middle Tennessee, we won't be able to see Deep Impact's collision with Tempel 1, but the big telescopes on Mauna Kea in Hawaii should have a good view and hopefully we'll get to see some fascinating and scientifically valuable imagery from them.

Speaking of observing from middle Tennessee, don't forget to attend the BSAS' next private star party on July 6<sup>th</sup> at 8:00PM! The star party will be held at the loop parking lot located at approximately mile 433.5 of the Natchez Trace. See you there!

**FOR SALE**

FOR SALE: Orion 80mm ED apochromatic refractor in excellent condition. Comes with 8x50mm Orion finder, Lumicon 1.25" diagonal and lens caps, plus Orion soft case for the telescope. Very sharp, virtually color-free views. Asking \$520.

FOR SALE: Older Televue Gibraltar alt/az mount for small- to medium-sized refractors, with 4" Televue Clamshell and Orion Paragon HD-F2 tripod with fluid head and mounting shoe. Very stable mount for Orion 80ED 'scope above. Asking \$225.

OR, purchase all above for \$725. For further details, please contact John Harrington at 615-269-5078. Clear skies!

**MAGAZINE SUBSCRIPTIONS FOR  
BSAS MEMBERS**

We are always able to accept requests for new and renewal yearly subscriptions to SKY AND TELESCOPE and ASTRONOMY from our members in good standing.

The current yearly rates are as follows:  
SKY AND TELESCOPE: \$32.95  
ASTRONOMY: \$29.00

Checks or Money Orders should be made out to the Barnard-Seyfert Astronomical Society (BSAS) and sent to the following address:

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

**DUES INFORMATION**

On your Eclipse mailing label is the expiration date for your current membership in the BSAS. There will be a two month grace period before any member's name is removed from the current mailing list. You will be receiving a number of warnings informing you that your membership is expiring.

Dues per year are \$20.00 Regular (1 vote); \$30 Family (2 votes); \$15.00 Student (under 22 years of age)(1 vote); \$15 Seniors (65 years or older)(1 vote); \$25 Senior Family (65 years or older)(2 votes). Please call President, John Harrington, (615) 269-5078 if you have questions. Dues can be sent to:

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**THE ECLIPSE NEWSLETTER**

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BSAS Logo by Tony Campbell

## Happy Birthday Apollo-Soyuz

by Robin Byrne

This month we celebrate the anniversary of a milestone in the history of space exploration. In 1970, at the peak of the Apollo missions to the Moon, a delegation of Americans went to Moscow to discuss a joint US-Soviet space mission. The intent was to not only officially bring the "Space Race" to a close, but to also test technology needed for future cooperation in space.

Several hurdles needed to be dealt with along the way. The first was to determine how to connect two vehicles with very different docking mechanisms. The solution was to build a special docking device with a US-friendly docking ring on one end, and a Soviet-friendly ring on the other. Another problem was that the Soviet Soyuz capsule used a higher air pressure than the American Apollo capsule, and a different air mixture. To address this difference, the docking mechanism also provided an intermediate pressure and air environment, so that the Soviet Cosmonauts would not get the bends upon entering the Apollo capsule. And, possibly the biggest difficulty of all was the language barrier. Both crews had to learn the other's language, to allow them to communicate during the tricky docking maneuver.

On July 15, 1975 two launches took place: the Soyuz 19 launched first, with the Apollo 18 launch occurring seven hours later. On board the Soyuz capsule were Alexei Leonov (Commander) and Valery Kubasov (Engineer). Both were veterans of previous flights, Leonov being the first man to walk in space. The Apollo crew were Thomas Stafford (Commander), Vance Brand (Command Module Pilot), and Deke Slayton (Docking Module Pilot). This was Stafford's fourth flight, but the first for both Brand and Slayton. Although Slayton was an original Mercury Astronaut, he had been grounded due to a heart fibrillation since 1962.

Once in orbit, the Apollo capsule was rotated to dock with and retrieve the connector module from the rocket booster. Two days later, the Apollo capsule had maneuvered into position for docking with the Soyuz. Three hours later, Stafford and Leonov exchanged the first international handshake in space. For two days, the crews moved freely back and forth between the two spacecraft. Many items were exchanged between the crews, including flags and tree seeds (which were later planted in both countries). The crews ate together and had a joint television broadcast. Both President Ford and Premier Brezhnev spoke with the crew members and offered congratulations.

A variety of experiments were performed jointly, the most important being several practice runs at docking and undocking. The skill gained from those activities have been used for Shuttle visits to Mir, and for the construction and support of the International Space Station. One of the more interesting experiments occurred after one of the undocking maneuvers. The Apollo craft was positioned to eclipse the Sun so that the Soyuz crew could photograph the Sun's corona. Apollo-Soyuz was also the first mission that included as part of the equipment a handheld, programmable calculator (an HP-65) to use in case of computer failure. It was never used.

On July 21, the Soyuz capsule successfully landed in Kazakhstan. The Apollo crew remained in orbit for three more days. During splashdown in the Pacific Ocean, complications arose. Brand missed the time to activate two switches needed for deploying the parachutes. Stafford had to deploy them manually, but the swinging of the craft caused two thrusters to fire. Stafford shut them down, but not soon enough. The firing released nitrogen tetroxide fumes, which entered the crew cabin through a pressure-relief valve. The fumes caused Brand to black out, and all three men had to be hospitalized for two weeks, receiving treatment for blistering in their lungs.

Apollo-Soyuz marked both an end and a beginning. It was the last flight of an Apollo spacecraft, the last US flight launched by a traditional booster rocket, and the last US flight prior to the Shuttle missions. However, it was the beginning of international cooperation in space. The International Space Station is the legacy of this first attempt to work with another country in the exploration of space. This month, the Space Shuttle is scheduled to return to flight. The primary mission of this flight is to deliver equipment and supplies to the US-Russian Space Station crew. Now that working with Russia and other countries is taken for granted, take a moment to remember our first steps away from competition and toward cooperation that was made a reality by the Apollo-Soyuz mission.

### References:

Apollo-Soyuz Test Project  
<http://history.nasa.gov/astp/>

Apollo-Soyuz Test Project biography.ms  
<http://www.biography.ms/Apollo-Soyuz.html>

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<http://www.daviddarling.info/encyclopedia/A/Apollo-Soyuz.html>

**Barnard-Seyfert Astronomical Society  
Minutes of a Regular Meeting of the Board of Directors  
Held On Tuesday, June 2, 2005**

The board of Directors of the Barnard-Seyfert Astronomical Society met in regular session at the Jefferson Square Club House in Nashville, Tennessee on June 2, 2005. A sign-in sheet was circulated in lieu of a roll call. President John Harrington declared a quorum to be present and called the meeting to order at 7:40 P.M. Board members Joe Boyd, Tony Campbell, JanaRuth Ford, Bill Griswold, John Harrington, Bob Rice, and Pam Thomas were present. Board members Mike Benson, Kris McCall, Randy Smith, and Gary Wilkerson were absent. In addition to members of the board, BSAS Equipment Committee member Keith Burneson, Equipment Committee Chair Lonnie Puterbaugh, and TNSP Committee Member Heinrich Tischler were also present.

John Harrington distributed copies of the National Park Service's permit allowing the BSAS to use two designated sites on the Natchez Trace Parkway for star parties. These specified sites are at Milepost 411.8 (Water Valley Overlook) and Milepost 433.5 (loop parking lot). Additionally, requirements for a performance bond, liability insurance, and fees were waived. The Park Service's signing and returning this document will officially complete our long-sought authorization. However, Mr. Harrington noted that the distributed copies bearing only his signature should be sufficient for the BSAS to properly conduct the planned private star party at the 433.5 mile-marker parking lot on June 4.

Bob Rice reported that Hardin Optical Company had donated a six inch Dobsonian telescope as a door prize for the Tennessee Star Party (TNSP) to be held on October 7-9, 2005. John Harrington encouraged others who had agreed to solicit donations to pursue those vendor requests. Mr. Rice volunteered to contact Oceanside Photo & Telescope and Orion Telescopes & Binoculars for donations.

Reporting for Treasurer Randy Smith, John Harrington stated that the BSAS' checking account balance was approximately \$6,000.00. Joe Boyd commented that the Long Range Planning Committee meeting originally planned for Tuesday, June 14, will probably be rescheduled.

Equipment Committee Chair Lonnie Puterbaugh recognized Keith Burneson for "saving the day" by his timely arrival with the Society's Meade LX200 telescope during a recent outreach presentation at Castle Heights Upper Elementary School. Mr. Puterbaugh also complimented Mr. Burneson for his quick mastery of this complicated scope since taking charge of it a short time ago.

John Harrington suggested the formation of a group to oversee the "Astronomy 101" instructional sessions that were approved at the May 5, 2005 board meeting. Most of the current attendees agreed to serve on this group and to meet at Mr. Harrington's home on June 9 at 7:30 P.M.

John Harrington suggested having a BSAS summer picnic this year and a discussion of various times and locations followed. Lonnie Puterbaugh graciously offered his home for this event which met with unanimous agreement. A specific date and time for the picnic will be set at the July board meeting.

Joe Boyd announced that Lonnie Puterbaugh would make a 3 to 5 minute presentation on comets at the "Here Comes the Sun" outreach session for 6 to 12 year-olds at the Warner Park Nature Center on Wednesday, June 29. Mr. Boyd also noted that this event would include "go to" stations and feature ice cream "comets" made from a NASA-supplied recipe.

Program Committee Chair JanaRuth Ford announced this tentative meeting presentation schedule:

- Jun    *How Do We Know?*    Dr. Tim Ferris, Ball State University
- Jul    *TBA*    Dr. Charles McGruder, Western Kentucky University
- Aug    *TBA*
- Sep    *Astro Imaging*    BSAS member Mark Manner
- Oct    *Martian Geology*    Dr. Jeff Marsh, U.T. Knoxville
- Nov    *Galactic Dynamics*    Dr. Bill Keel, University of Alabama
- Dec    *The Star of Bethlehem*    BSAS members Joe Boyd and Powell Hall

Board of Directors Meeting, continued from page 4

The board discussed several measures to reverse the general decline in membership and meeting attendance. One suggestion was to have a series of "help with telescopes" sessions or "collimation fests." John Harrington suggested that board members might personally contact inactive members. Lonnie Puterbaugh suggested designating specific individuals to actively greet members and guests as they arrive at meetings.

Lonnie Puterbaugh displayed two draft t-shirt designs for TNSP 2005 that continued the cows theme originated at the first TNSP. No decision was made to adopt either design

There being no further business to discuss, President Harrington declared the meeting adjourned at 9:00 P.M.

Respectfully submitted,  
Bob Rice

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### **The Grand Tour: A traveler's Guide to the Solar System** **By William K. Hartmann and Ron Miller**

**The Grand Tour** is an astronomy classic that takes readers on an imaginative trip through every corner of the solar system. With revised and updated drawings on recent discoveries made by Voyager I and II, the Hubble Space telescope, the Mars Global Surveyor Mission, and other space initiatives, **The Grand Tour** is a dazzling journey that combines lush art and up-to-the-minute science. One hundred new paintings give travelers an unprecedented view of phenomena such as Saturn's rings from Saturn itself, the rusty red dunefields of Mars, the craters of Mercury, and the Kuiper belt of planetesimals.

The Workman Publishing has offered to sell this 296 page book to members of the BSAS for the retail price of \$20.95 for orders of 1-9 copies and orders of 10-24 will cost \$12.57 each and 25 or more will cost \$10.48. These prices include shipping and handling.

At this writing, 11 persons have expressed a desire to purchase one of these fine books. The moneys will be taken up at the July membership meeting. The price will be \$12.57 or less as the list grows. Bring your money to the July 21, 2005 meeting. A copy of the book will be on hand to see at this meeting. Contact Bill Griswold

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### **NASA Discovery Mission Deep Impact Spacecraft** **A reminder**

The real fireworks this coming July will be out of this world! On 4 July 2005, the NASA Discovery Mission Deep Impact spacecraft will release an 820-pound (370-kg) "smart impactor" into the path of Comet Tempel 1. The resulting crater should be somewhere between the size of a house and a football stadium and could be up to fourteen stories deep. Astronomers and scientists hope to be able to determine something about the material in the comet from the debris ejected from the impact. The brightness of the comet may be increased after the impact

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**Barnard-Seyfert Astronomical Society  
Minutes of the Monthly Membership Meeting  
Held on Thursday, June 16, 2005**

President John Harrington called the meeting to order at 7:47 P.M. at the Adventure Science Center (ASC) and welcomed new members, returning members, and visitors. The minutes of the previous membership meeting held on May 19, 2005 were approved without objection as published in the June 2005 issue of the *Eclipse* newsletter.

John Harrington introduced Dr. Tim Farris from the Mathematics & Science Division at Volunteer State Community College who delivered the evening's program on the historic determination of two basic measurements in astronomy: (1) the earth's distance from the sun and (2) the speed of light. Dr. Farris first traced the development of the earth-sun distance from the broadly accurate visual sightings and trigonometric calculations of the ancient Greeks up through today's radar measurements to within a few meters. Next, Dr. Farris outlined the measurement of the speed of light from Galileo's attempts with covered lanterns in the 1600's to modern calculations involving lasers and Quantum Theory. The audience was particularly fascinated by Dr. Farris' description of a simple experiment using the measured pattern of marshmallows cooked in a microwave oven (which is analogous to light's wavelength) and the frequency from the tag on the back of the oven to roughly calculate the speed of light. Dr. Farris finished by graciously answering questions from the audience.

John Harrington recalled the meeting to order at 9:01 P.M and announced that the National Park Service had issued a signed permit allowing the BSAS to use the Milepost 411.8 (Water Valley Overlook) and Milepost 433.5 (loop parking lot) sites on the Natchez Trace Parkway for specified star parties during the remainder of 2005. Mr. Harrington noted that copies of this permit would be distributed to BSAS officers and board members – at least one of whom should be present at these designated star parties – to show to park rangers if requested.

Treasurer Randy Smith reported that the BSAS' checking account balance was \$6,052.38 at May 31. Webmaster Tony Campbell described how members could easily check their dues status and renewal dates on the BSAS' website. Dark Sky Committee Chair Powell Hall announced that this committee would next meet on July 5<sup>th</sup>. Lonnie Puterbaugh announced that he would address the Von Braun Astronomical Society in Huntsville, Alabama on Friday, June 17<sup>th</sup>. Mr. Puterbaugh also announced that, while attending the 35<sup>th</sup> Annual Apollo Rendezvous in Dayton, Ohio, he talked to representatives from Camera Concepts in New York who agreed to be vendors at our Tennessee Star Party (TNSP).

Joe Boyd announced that 60 children had signed up for the "Here Comes the Sun" program to be staffed by BSAS members at the Warner Park Nature Center on Wednesday, June 29. Mr. Boyd also noted that this event would include "go to" stations and feature ice cream "comets" made from a NASA-supplied recipe. John Harrington announced that the next private star party would be held at the closer Natchez Trace site on the evening of July 9.

Joe Boyd announced that BSAS members will conduct an "Astronomy 101" basic information program at the Warner Park Nature Center starting at 6:00 PM on Thursday, September 8<sup>th</sup>. Joint sponsor Warner Park will publicize this session which will open to the public and include a pot-luck dinner on the picnic tables at 8:00 PM to be followed by a star party.

Several members announced that they had telescopes for sale. Further information will be placed in the *Eclipse* newsletter and on the BSAS website. Mike Benson announced that he wanted to start a "Sushi Saturday" luncheon get-together at 12 PM at Shintomi Japanese Restaurant located on Bandywood Drive behind Davis-Kidd Booksellers on each Saturday following the BSAS monthly meeting. Bill Griswold announced that he was taking orders for the 296 page book of astro-pictures *Grand Tour* by Ron Miller and William Hartman. This book normally retails for \$19.95, but will be available from the publisher for \$11.97 if 11 to 14 copies are ordered and for \$9.98 if more than 24 copies are ordered. Mr. Griswold invited those interested in ordering this book to contact him by telephone or email.

John Harrington reminded all attendees about the upcoming TNSP on October 7-9 and asked for volunteers to serve on the Registration, Signs, Snack Bar, and Clean-up Committees. JanaRuth Ford announced that arrangements were still underway for astronomy artist Don Chessman to attend the TNSP.

Since there was no further business to discuss, President Harrington adjourned the meeting at 9:35 P.M.

Respectfully submitted,  
Bob Rice  
Secretary

**Picture by Mark Manner**

Two spiral galaxies in Virgo: Magnitude 9.3 Messier 61 and companion, magnitude 12.9 NGC 4301. Data taken May 10, 2005. Seeing was average, with very high humidity. The image consists of sixteen 5 min luminance subframes binned 1x1, and seven 3 min subframes in red, green and blue, binned 2x2. I used an SBIG STL6303E ccd camera, Astrodon LRGB filters, an RCOS 16 Ritchey-Chretien telescope at F9, and a Paramount ME mount. Data was acquired and autoguided with CCDSoft, and processed with MaximDL, Registrar, Sigma Clip Pre Beta 11, CCDSharp and Photoshop CS2.



## Activities and Events

July 1 — 31, 2005

7/1 Double shadow transit on Jupiter  
 7/2 Moon 0.8° S of Pleiades (M45)  
 7/3 Mercury 0.9° S of Beehive (M44) (25° E)  
 7/4 Venus 0.06° N of Beehive (M44) (25° E)  
 7/4 NASA, Deep Impact Smart Impactor to strike comet  
     Tempel 1  
 7/6 NEW MOON  
 7/7 Mercury 1.6° S of Venus (26° E)  
 7/7 BSAS Board of Directors mtg., 7:30 p.m.  
 7/9 Private star party (Natchez Trace Mile 433.5 parking  
     lot)  
 7/13 Jupiter 0.8° N of Moon, occultation  
 7/14 FIRST QUARTER  
 7/21 FULL MOON (largest of 2005)  
 7/21 BSAS monthly mtg., 7:30 p.m., at Adventure Science  
     Center  
 7/28 LAST QUARTER  
 7/29 Moon 0.6° S of Pleiades (M45)

August 1 — 31, 2005

8/4 NEW MOON; BSAS Board of Directors mtg., 7:30  
     p.m.  
 8/6 Private star party (Natchez Trace Mile 433.5 parking  
     lot)  
 8/7 Venus 1.2° S of Moon  
 8/8 Neptune at opposition  
 8/9 Jupiter 1.3° N of Moon  
 8/12 Perseid meteors peak  
 8/12 FIRST QUARTER  
 8/14 Antares 0.4° S of Moon  
 8/18 BSAS monthly mtg., 7:30 p.m., at Adventure Science  
     Center  
 8/19 FULL MOON  
 8/20 Uranus 2° N of Moon  
 8/23 Mercury greatest elongation W (18°)  
 8/26 Moon 9.4° S of Pleiades (M45)  
 8/26 LAST QUARTER

Note: all dates &amp; hours according to Central Time

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