ECLIPSE

The Newsletter of the Barnard-Seyfert Astronomical Society

Celebrating our 77th Year **August 2005**

The Membership meeting will be held on August 18, 2005
at the Adventure Science Center at 7:30 pm.
The speaker will be Ms. Mitzi Adams

Mitzi Adams is a solar astronomer for NASA's Marshall Space Flight Center, now housed in the National Space Sciences and Technology Institute in Huntsville, Alabama.

Her research includes studying the magnetic fields associated with sunspots by measuring the direction and magnitude of a sunspot's magnetic field. If the magnetic field becomes twisted, the sunspots may produce a flare. One of the things she is trying to determine is how to predict which sunspots will flare and which flares will produce "coronal mass ejections", gigantic explosions of material which can travel through interplanetary space and affect the Earth through aurora, loss of communication with satellites, and power grid disruptions. Ms. Adams analyzes data acquired with MSFC's solar vector magnetograph and is beginning a project to analyze Chandra X-ray data of stellar sources. Previously, Ms. Adams has written software to prepare for ground-based support of the HESSI mission and has analyzed calibration data from the NOAA Soft X-Ray Imager (SXI), built at MSFC.

Ms. Adams is very involved in education and public outreach activities, frequently giving workshops for teachers and students at NASA's Educator Resource Center and at the Institute for Science Education at the University of Alabama in Huntsville. She also gives tours of the solar observatory facilities and has given numerous presentations in local schools.

FROM THE PRESIDENT

by John Harrington, President

Trouble for Hubble—that's what NASA's continuing problems with the space shuttle program mean. Space Shuttle Discovery and its seven-person crew launched safely from Cape Canaveral on July 26th, beginning a 12-day mission to resupply the International Space Station and to literally "take out the trash" that has been accumulating on the ISS for the last couple of years (yuck). But we now know that another large chunk of protective heat-resisting foam peeled off from Discovery shortly after launch, and that has led NASA to ground the entire shuttle fleet once again.

As most of you know, NASA's previous director firmly rejected a space shuttle mission to repair the aging Hubble Space Telescope as too risky. Widespread rumors have it that NASA's new director, Michael Griffin, favors a Hubble repair mission, assuming that shuttle operations can be made relatively safe.

As I noted in my column a couple of issues back, Hubble is clearly NASA's premier space telescope in the public mind, no doubt because Hubble sees the galaxy in the same wavelengths of light that we humans do. Anything that has returned over 700,000 extremely high-quality astro-photos over 15 years (from Comet Shoemaker-Levy's

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crash into Jupiter to NASA's Deep Impact crash into Comet Tempel I) is clearly a major asset. While the Chandra X-Ray Observatory and other space-based NASA and ESA telescopes provide valuable and at times stunning imagery and data, I believe the public's support for spending major dollars on space-based observatories arises directly from Hubble's spectacular imagery over the years.

The most famous Shuttle voyage of all time was Shuttle Endeavor's mission to correct Hubble's flawed optics back in 1993. During that mission, astronauts conducted five separate space walks to repair the Hubble and in so doing demonstrated the immense flexibility they bring to space work and exploration.

Let's hope that NASA has the fortitude to once again tackle a fix to the space shuttles' foam shedding problem and then go for a replay of that memorable Hubble repair mission. With luck, the batteries and gyroscopes on a repaired Hubble will keep the aging telescope going until at least 2011, when Hubble's more-or-less replacement (the much larger James Webb space telescope) is due to lift off.

Closer to home, please make it a point to attend the next BSAS private star party, scheduled for 8:00PM this coming Saturday, August 6th at the loop parking lot located at approximately mile 433.5 of the Natchez Trace. BSAS member and video-imaging expert Lonnie Puterbaugh has kindly arranged to have a total of five different astro-video cameras available at this event. Increasingly sensitive video cameras are helping to transform our hobby and are vastly facilitating outreach efforts, and this is the best chance you may ever have to compare five different models side-by-side.

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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Barnard-Seyfert Astronomical Society
Minutes of a Regular Meeting of the Board of Directors
Held On Thursday, July 7, 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 July 7, 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 7:38 P.M. Board members Mike Benson, Joe Boyd, Tony Campbell, JanaRuth Ford, Bill Griswold, John Harrington, Bob Rice, and Gary Wilkerson were present. Board members Kris McCall, Randy Smith, and Pam Thomas were absent. In addition to members of the board, BSAS Equipment Committee member Keith Burneson and Equipment Committee Chair Lonnie Puterbaugh were also present.

John Harrington, reporting for Treasurer Randy Smith, announced that the BSAS' checking account balance was $6,150.33 at June 30, 2005. Mr. Harrington reported that the Equipment Committee had met on Wednesday, July 6, to work on a slide presentation and the BSAS' permanent traveling display. The minutes of the previous board meeting held on June 2, 2005 were approved without objection as published in the July 2005 edition of the *Eclipse* newsletter. Mr. Harrington also announced that no Dark Sky Committee meeting would be held during August, but that the next meeting was scheduled for the first Tuesday in September. Mr. Harrington announced that the BSAS membership had dropped below 100 and that board members would contact members who were late in paying their dues.

Program Committee Chair JanaRuth Ford announced these topics and speakers for upcoming membership meetings:

- July - *Astronomy in Third World Countries* - Charles McGruder
- August - *Solar Science* - Mitzi Adams
- September - *Imaging Techniques* - Mark Manner
- October - *TBA*
- November - *Relativity* - William Keel

Ms. Ford noted that she hoped to have Jeff Moersch speak on *Martian Geology* at the October meeting if his schedule permitted; otherwise we might hold a telescope workshop. Following her announcement, the board gave Ms. Ford a well-deserved round of applause for developing an outstanding series of programs.

Equipment Committee Chair Lonnie Puterbaugh noted that we had quite a few digitized pictures from BSAS activities over the last several years to update the Society's traveling display. John Harrington commented that we also needed to update the BSAS' public information pamphlet. Mr. Harrington reminded the board of the private star party scheduled for 8:00 PM on Saturday, July 9 at the 433.5 mile marker site on the Natchez Trace Parkway

Bob Rice reported that Hardin Optical Company had donated an 80mm refractor telescope with an equatorial mount as a door prize for the 2005 Tennessee Star Party (TNSP). Mr. Rice also moved that, as the TNSP treasurer, he be authorized to open a checking account in the name of "TNSP 2005" and be advanced $200.00 for this purpose. Joe Boyd seconded this motion that passed by a unanimous voice vote after only slight discussion. John Harrington announced that the design displayed at the June 2 board meeting that depicted cows and a UFO was selected for the TNSP 2005 T-shirt logo.

John Harrington announced that the Astronomy 101 basic instruction presentation would be held at the Warner Park Nature Center on September 8 at 6:00 P.M. This event will include dinner and be followed by a stargazing session. Mr. Harrington noted that the park rangers had graciously agreed to stay beyond their normal quitting time until 9:30 P.M.

John Harrington reported that no action had been taken on the proposed BSAS observing awards program. Mr. Harrington thanked Keith Burneson for developing a complete and well-documented operating manual for the Society's LX-200 loaner telescope. JanaRuth Ford announced that NASA had awarded the BSAS a Solar Scope for excellence in astronomy outreach during our Astronomy Day activities earlier this year.

There being no further business to discuss, President Harrington declared the meeting adjourned at 8:05 P.M.

Respectfully submitted,
Bob Rice, Secretary

Happy Birthday Gemini 5

by Robin Byrne

This month we celebrate the anniversary of one of the many milestones in the early space program. At 9 am EST on August 21, 1965 Gordon "Gordo" Cooper (Commander) and Charles "Pete" Conrad (Pilot) launched into orbit aboard the Gemini 5 spacecraft. This would be Conrad's first flight and Cooper's second, making him the first person to participate in two different orbital flights.

Prior to the flight, Cooper realized that all of the military organizations in which he had been involved had some kind of patch. He suggested to NASA that the space missions should have their own patches. NASA agreed, so he and Conrad designed the first space program mission patch. The design included a picture of a covered wagon, to represent the fact that they were pioneers in space. Cooper wanted to include the slogan "8 Days or Bust", a reference to the mission's planned duration, but NASA officials were concerned with the impression of failure (a "bust") if they did not achieve the planned eight days. Modern reproductions now include the motto.

The eight day duration would be a first for NASA, longer than any previous flight. Intentionally similar in length to a Moon mission, the eight days were used to evaluate the health affects of long duration weightlessness. Some of the medical experiments conducted during the flight included testing to see if weightlessness changed their eyesight, how their hearts were affected, and if their ability to make measurements changed.

The longer duration also required a more efficient way to generate energy. This provided an opportunity to evaluate a new power source: fuel cells. This would be the first flight using fuel cells, but certainly not the last. Early in the mission, there was a problem with one of the cells losing pressure, which led Cooper to make the decision to shut the cell off. Without this power, they had to abort one of the rendezvous objectives. Later in the mission, the cell was turned back on and tested. They discovered that the cells could still be used after shut down.

The original rendezvous objective was with a radar evaluation pod (REP), which was released shortly after orbit was achieved. When the original rendezvous was aborted, people on the ground tried to come up with an alternate plan. Edwin "Buzz" Aldrin, whose Ph.D. was in orbital mechanics, came up with the idea of a "phantom rendezvous." Instead of meeting up with a physical object, just see whether the vehicle can be maneuvered to a specified point in space. This worked out very well, with both Cooper and Conrad moving the spacecraft to different "rendezvous" locations.

Other mission objectives involved taking photographs from the capsule. Some of the pictures included imagery of the zodiacal lights and gegenschein from space. Pictures of Earth provided more detail of some areas than were on the best maps of the time. And a cloud-top spectrometry experiment showed that the height of clouds can be measured from space, which would prove to be invaluable for meteorologists.

The last objective would be a controlled reentry to land at a specified point. This objective was not achieved due to a programming error. The person who wrote the computer program entered in as Earth's rotation rate 360 degrees per 24 hours. However, every good astronomer knows that 24 hours is a Solar day (time to rotate relative to the "moving" Sun) rather than a Sidereal day (time to rotate relative to the "fixed" stars), where the Sidereal day is about 4 minutes less than 24 hours. This resulted in the spacecraft landing far from the target area. The Gemini 5 capsule splashed down a little over 90 miles from the intended location, 104 minutes shy of eight days in space.

Although not as spectacular or flashy as some of the other early space missions, Gemini 5 was a ground breaker. Not only are fuel cells now standard equipment in the space program, they are also being studied as potential alternatives to using gasoline to power cars. The cloud spectrometry experiments led to techniques readily observed in any weather forecast. The medical tests were yet another small step toward longer space missions - steps still being taken today aboard the International Space Station. By the time this article is printed, the Space Shuttle will have, hopefully, successfully returned to space. The pioneering spirit of the early astronauts continues to reach for new frontiers. Take a moment to remember some of the first explorers and their journey, the crew and mission of Gemini 5.

References:

NASA Project Gemini-V http://science.ksc.nasa.gov/history/gemini/gemini-v/gemini-v.html

Gemini 5: In formation From Answers.com http://www.answers.com/topic/gemini-5

NSSDC Master Catalog: Spacecraft http://nssdc.gsfc.nasa.gov/database/MasterCatalog?sc=1965-068A

Barnard-Seyfert Astronomical Society
Minutes of the Monthly Membership Meeting
Held on Thursday, July 21, 2005

President John Harrington called the meeting to order at 7:40 P.M. in the Adventure Science Center and welcomed new members and visitors. The minutes of the previous membership meeting held on June 16, 2005 were approved without exception as published in the July 2005 issue of the *Eclipse* newsletter.

Treasurer Randy Smith reported that the BSAS' bank balance was $5,888.38 at June 30, 2005. Mr. Smith also invited attendees to sign up to purchase copies of the 2006 Kalmbach Astronomy Calendar and the RASC 2006 Observers Handbook. Equipment Committee Chair Lonnie Puterbaugh reported the purchase of another 6" Dobsonian telescope from Hardin Optical Company for the BSAS' loaner scope program. Mr. Puterbaugh noted that, except for the 4.5' Dobsonian, all available scopes were loaned out. Dark Sky Committee Chair Powell Hall reported that this committee would next meet on September 6th.

John Harrington announced that NASA's Return to Flight shuttle launch was tentatively scheduled for July 26th. Lonnie Puterbaugh noted that retired NASA employees operated a space flight museum at the Sears Mall in Titusville, Florida. Bill Griswold invited attendees to sign up to purchase copies of the book *Grand Tour* by Ron Miller and Bill Hartman. Mr. Griswold pointed out that this book normally sells for $19.95, but would 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.

John Harrington reminded everyone of the private star party scheduled for August 6th at mile marker 433.5 on the Natchez Trace Parkway. Lonnie Puterbaugh announced that 6 video cameras would be set up for a side-by-side comparison at this star party. John Harrington announced that BSAS members would conduct an "Astronomy 101" basic information program at the Warner Park Nature Center starting at 6:00 P.M. on Thursday, September 8th.

Program Committee Chair JanaRuth Ford introduced Dr. Charles McGruder, the William McCormack Professor of Physics at Western Kentucky University, who delivered a presentation on Third World Astronomy – Prospects for Research Telescopes in Rwanda, Nigeria, and Namibia. Dr. McGruder enthusiastically described his personal efforts to develop national pride and a sense of accomplishment in these three African countries through science rather than sports. Dr. McGruder proposed accomplishing this objective by locating a series of research grade robotic telescopes in these nations, noting that Namibia in particular had one of the three best dark sky locations in the world (the other two being in Chile and Hawaii). He also recounted his several visits to secure sites and to establish PHD level educational programs in these countries. Acknowledging that funding is always a problem, Dr. McGruder emphasized the notion that science is for all states, not just the western nations and promoted the realistic prospect of front line astronomical research being done by black Africans. Dr. McGruder then generously answered questions from the audience and received an impromptu round of applause at the conclusion.

John Harrington recalled the meeting to order at 9:01 P.M. JanaRuth Ford announced that the Astronomical Society of the Pacific had awarded a Solar Scope to the BSAS for excellence in astronomy outreach during our Astronomy Day activities earlier this year. Mr. Harrington announced that copies of a DVD celebrating the 15th anniversary of the Hubble Space Telescope were available on the United Nations website. Bill Griswold reminded everyone to turn in his or her nametags at the conclusion of the meeting.

Gary Yarnall asked members to donate old copies of astronomy magazines for his students at White Bluff High School. Mr. Yarnall can be reached by phone at 615-797-3971 or by email at gyarnall@aol.com. Bill Griswold asked the audience to encourage delinquent members to renew their memberships by checking the BSAS website for their renewal dates. JanaRuth Ford announced that NASA's Mitzi Adams would present the August program on solar science.

Bob Rice announced that space artist Mike Chessman, Hardin Optical Company, and Orion Telescopes and Binoculars had donated items for door prizes at the Tennessee Star Party (TNSP) in October. John Harrington asked for volunteers to serve on the TNSP Registration, Signs, Snack Bar, and Cleanup Committees. Lonnie Puterbaugh announced that Dr. Richard Schmude (Gordon College), Dr. Charles Higgins (MTSU), Dr. Bob O'Dell (Vanderbilt), and BSAS members Loren Ball and Dr. Spencer Buckner (APSU) would be speakers at the TNSP this fall.

Since there was no further business to discuss, President Harrington declared the meeting adjourned at 9:19 P.M.

Respectfully submitted,
Bob Rice, Secretary

Activities and Events

August 1 — 31, 2005

8/2 No meeting of the Dark Sky Committee
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

September 1 — 30, 2005

9/1 BSAS Board of Directors mtg., 7:30 p.m.
Uranus at opposition
9/2 NEW MOON; Venus 1.4˚ S of Jupiter (39˚ E)
9/3 Private star party (Natchez Trace Mile 433.5 parking lot)
9/5 Venus 1.8˚ N of Spica (39˚ E)
9/6 Jupiter 1.8˚ N of Moon
9/6 Dark Sky Committee meeting, 7:30, call Powell Hall, 872-0162
9/7 Spica 1.3˚ S of Moon
Venus 0.6˚ N of Moon
9/10 Antares 0.2˚ S of Moon
9/11 FIRST QUARTER
9/15 BSAS monthly mtg., 7:30 p.m., at Adventure Science Center
9/16 Uranus 2˚ N of Moon
Saturn 1.2˚ S of Beehive (M44) (46˚ W)
9/17 FULL MOON (the Harvest Moon)
9/22 Moon 0.3˚ S of Pleiades (M45)
Equinox (1723 hours)
9/25 LAST QUARTER

Note: all dates & hours according to Central Time

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