



ECLIPSE



The Newsletter of the Barnard-Seyfert Astronomical Society

Celebrating our 76th Year in 2004

January 2004

January 15, 2004 meeting of the BSAS, 7:30 pm at the Adventure Science Center

Are you hoping for a new telescope for Christmas? Think you'll want some advice on how to use it? Then come to the January meeting of the BSAS! We'll begin the program with a short description of the basic telescope types, and then split up into groups to review how the following telescope/mount combinations work:

- * Dobsonian-mounted reflectors ("Dobs")
- * Equatorially-mounted refractors
- * Fork-mounted Schmidt Cassegrains ("SCTs") and Maksutov Cassegrains ("MCTs" or "Maks")

Club members will bring examples of each of these telescope/mount combinations to the meeting that night, so that you'll have the chance to gain real "hands-on" knowledge about how to use your new window on the universe. Please contact BSAS Vice President John Harrington through the BSAS website if you have a particular make and model of scope you'd like advice on. See you on January 15th at the Adventure Science Center!

FROM THE PRESIDENT

Joseph M. Boyd, Jr.

As we start a new year, it is time to take stock of where we are and where we want the Barnard-Seyfert Astronomical Society to be in 2004 and beyond. For this reason, our Long Range Planning Committee is working to present us a plan for the next five years as a minimum and up to ten years in some areas. For any of you who desire to have input into this planning process, please contact our committee chair, Dennis Williams, and give him the benefit of your ideas and recommendations.

Our interest in the history of astronomy in the Nashville area was recently highlighted when Dyer Observatory celebrated the 50th anniversary of the dedication of the observatory, which was actually held on 27 December 1953. That is easy to remember because Mary I were married two days later, on 29 December 1953. I was in the Navy at that time, so was not aware of the momentous events that were transpiring on a hill out in the country south of Nashville, just off Granny White Pike. Carl Seyfert personally had the leading role in establishing and building that observatory. He literally oversaw every aspect of the construction of the building, and personally solicited the funds, materials, and fixtures from all over Nashville to make it possible. He went on to research a particular type of galaxies, which today are known as Seyfert Galaxies. His wife, Murial, was an astronomical scholar in her own right, as well as helping him and furnishing moral support for his many activities and endeavors. As Nashville's first television weather person, he did not miss an opportunity to throw in some astronomical data, and became known as "Mr. Astronomy" to the large TV audience, most of whom mourned his untimely death in 1960 in an automobile accident, while he was en route to the home of his good friend, Jack DeWitt, to pick up some equipment to take to the observatory. Those two made an awesome combination to popularize astronomy here, and we are the beneficiaries of their enlightened outreach.

Being a beneficiary, however, brings it own responsibilities. As those two sought to bring astronomy to the people, it is up to us to continue that work as a society. Jack DeWitt was active in the old Barnard Astronomical Society, and Carl Seyfert added his stature to our organization, so that at his death the club was renamed the Barnard-Seyfert Astronomical Society. Just as Carl Seyfert and Jack DeWitt did, we can also "take astronomy to the people". We don't have to ask people to come to us, we can come to them. We can work with the Sudekum Planetarium at Adventure Science Center to show the night sky to hundreds of people. We can go to Warner Park

Continued on Page 4

MEMBERSHIP

Check your Expiration Date on the mail label of your newsletter. Renew if the date is this month or some past month. If you receive your newsletter by e-mail, and your renewal is past you will receive a separate e-mail letter to inform you that you now owe dues. If you have any questions, call Bill Griswold, 615 297-2387 or e-mail bgriz@comcast.net. After two month of no response from you, you will be considered "Inactive" and will no longer receive newsletters.

Please rejoin

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I received the following in an email and promptly put it in my Astronomy Club Newsletter. I thought I would share it with you. I know nothing of the author or where it was originally posted.

Al-Gebra At New York's Kennedy airport today, an individual later discovered to be a public school teacher was arrested trying to board a flight while in possession of a ruler, a protractor, a setsquare, a slide rule and a calculator.

At a morning press conference, Attorney General John Ashcroft said he believes the man is a member of the notorious Al-Gebra movement. He is being charged by the FBI with carrying weapons of math instruction.

"Al-Gebra is a fearsome cult." Ashcroft said. "They desire average solutions by means and extremes, and sometimes go off on tangents in search of absolute value. They use secret code names like 'X' and 'Y' and refer to themselves as 'unknowns' but we have determined they belong to a common denominator of the axis of medieval with coordinates in every country."

"As the Greek philanderer Isosceles used to say, "There are three sides to every triangle" Ashcroft declared.

When asked to comment on the arrest, President Bush said, "If God had wanted us to have better weapons of math instruction, he would have given us more fingers and toes."

"I am gratified that our government has given us a sign that it is intent on protracting us from these math-dogs who are willing to disintegrate us with calculus disregard. Murky statisticians love to inflict pain on every sphere of influence," the President said, adding: "Under the circumferences, we must differentiate their root, make out point and draw the line."

President Bush warned, "These weapons of math instruction have the potential to decimal everything in their math on a scalene never before seen unless we become exponents of a Higher Power and begin to factor-in-random facts of vertex."

Attorney General Ashcroft said, "As our Great Leader would say 'read my ellipse. Here is one principle he is uncertain of: though they continue to multiply, their days are numbered as the hypotenuse tightens around their necks."

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, Joe Boyd, (615) 386-3134 if you have questions. Dues can be sent to:

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THE ECLIPSE NEWSLETTER

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Joe Boyd, President
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Jill Thompson, Secretary
Lonnie Puterbaugh, Treasurer
Powell Hall, Immediate Past President

Board of Directors

Mike Benson
Tony Campbell
JanaRuth Ford
Bill Griswold
Kris McCall
Pam Thomas

Logo Photograph:
Francisco Diego

Happy Birthday Robert Wilson

by Robin Byrne

This month we celebrate the achievements of a man who has made quite a bang in the astronomical world. Robert Woodrow Wilson was born January 10, 1936 in Houston, Texas. Growing up, he showed an interest in both music (playing piano and trombone) and in electronics. In high school, Wilson fixed radios and televisions for spending money, and built his own hi-fi set.

Wilson went to college at Rice University and graduated with honors in physics in 1957. The summer after graduating, he worked for Exxon and received his first patent, for a well-logging tool. Wilson then entered Caltech for a graduate program in physics. Here he discovered his interest in radio astronomy, with a nice mix of physics and electronics, but delayed starting on his work to get married to Elizabeth Sawin over the summer. The Owens Valley Radio Observatory had just been built, and Wilson went to work with John Bolton to map the brightest regions of the Milky Way in the radio part of the spectrum. This became the basis for his Ph.D. dissertation. Wilson graduated from Caltech in 1962, and remained there for an extra year to complete other research projects he had begun.

In 1963, Wilson went to work at Bell Laboratories in Holmdel, NJ with the other radio astronomer there, Arno Penzias. Their first research project would turn out to be big. They were studying radio emissions from the Milky Way using a very sensitive microwave receiver. However, they kept getting background noise. They explored various possible sources for the noise, such as internal electronic interference, and even cleaning out the pigeon droppings that had accumulated on the receiver, but nothing could eliminate the noise. Not only that, but they had the same noise no matter what direction they looked. Meanwhile, Robert Dicke at Princeton had done some calculations concerning the big bang, and predicted the universe should, after expanding and cooling, currently have a temperature of 3 degrees Kelvin. When Wilson and Penzias discussed their observations with Dicke, they realized that they had detected the 3 degree background radiation left over from the big bang. This was the first proof of the big bang theory. Wilson and Penzias shared a Nobel Prize in 1978 for this achievement.

Wilson continued to work at Bell Labs on various projects, including designing and building a device to automatically track the Sun to measure how the atmosphere affects sunlight, and various observations with a new millimeter wave receiver, including the discovery that carbon monoxide is abundant in our galaxy. In 1976, he became head of Bell's Radio Physics Research Department, a position he still holds today.

As controversial as the big bang can be, there is no doubt that many observations have supported this idea. Based on the discovery of the background radiation made by Wilson and Penzias, the Cosmic Background Explorer (COBE) spacecraft made a more detailed observation of that same microwave radiation. COBE's results exactly matched what the big bang model predicted and is considered a major proof that the model is correct. Not many scientists have the luck or ability to be a part of a major discovery. In Robert Wilson's case, he discovered that pigeon poop isn't the only source of noise in a receiver, but instead the entire creation of our universe is still faintly humming away.

References:

Robert Woodrow Wilson Autobiography Nobel Laureates Web Page
<http://www.nobel.se/physics/laureates/1978/wilson-autobio.html>

Cosmology - Penzias and Wilson's Discovery is One of the Century's Key
 Advances Web Page
<http://www.bell-labs.com/project/feature/archives/cosmology/>

Wilson, Robert Woodrow Britannica Nobel Prizes Web Page
http://www.britannica.com/nobel/micro/641_29.html

MEMBERSHIP continued from Page 1

The dues structure is as follows:

Astronomy = \$29.00
 Sky & Telescope = \$32.95

R = Regular = \$20
 RF = Regular Family = \$30
 S = Senior member (over 64) = \$15
 SF = Senior Family (over 64) = \$25
 ST = Student (under 22 years) = \$15

Send check to BSAS
 at

BSAS
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Loaner telescope Program in work

Meigs Magnet School would like to thank BSAS for the use of the BSAS 8" Bradford Memorial Telescope. Students used the scope during an overnight star party held at LBL. The telescope provided outstanding views of nebulae but Saturn elicited the most "aaaaahs" and "woowws." The event was organized by BSAS member David Hartmann (not in photo) who teaches at Meigs.



President's Message, continued from Page 1

and help show the wonders of astronomy as well as to Long Hunter State Park. We can go to the various school classes and present programs either during the day at school or at night in various locations. We can go to Girl Scout and Boy Scout troops and help them with their astronomy merit badges, or just help get them interested in the sky. We can present programs to the Civil Air Patrol cadets to assist them in their aerospace curriculum. And we must not overlook the opportunity to present programs to church groups, both adults and young people. We should even try to take astronomy to the people by some sidewalk astronomy, which I hope to see us expand in this coming year. Thus we will earn the right to adopt as our motto, "Taking Astronomy to the People".

As I am writing this, I have already been made aware of the fact that many people received or gave telescopes as Christmas gifts, and that many of them do not have a clue how to assemble or use their new equipment. This is a golden opportunity for us in BSAS. We have a chance to be of real service to those people, and to incorporate them into our Society. Some of those telescopes they have received will probably never work well, but we can advise them so they are not so frustrated they are turned off to astronomy. We can literally reach out to those people, and that is another definition of "Outreach".

Our December meeting/dinner was a huge success. Everyone I have talked to has indicated he or she really enjoyed the opportunity to socialize, to eat together, and to discuss astronomy. We had an outstanding program by Professor (full) Richard Schmude of Gordon College in Georgia. It was also the first public use of our new sound equipment, and it was a resounding (pun intended) success. If you missed this event, you missed a genuine highlight of a year that has seen many premier events.

Our committees are working, our members are renewing their memberships, and we are getting new members each week. Opportunities are all around us. With all of that going on, 2004 should be our greatest year yet. Vision + opportunity + responsible response + hard work = success.

Minutes of a Regular Meeting of the Board of Directors of the Barnrd-Seyfert Astronomical Society Held On December 4, 2003

The Board of Directors of the Barnard-Seyfert Astronomical Society met in regular session at the Jefferson Square Club House in Nashville, Tennessee on December 4, 2003. A sign-in sheet was passed around in lieu of a roll call. President Joe Boyd declared a quorum to be present and called the meeting to order at 7:45 P.M. Board members present were Mike Benson, Joe Boyd, Janaruth Ford, Bill Griswold, John Harrington, Kris McCall, Lonnie Puterbaugh, and Pam Thomas. Board members Tony Campbell, Powell Hall, and Jill Thompson were absent. In addition to members of the Board, BSAS members Bob Rice and Heinrich Tischler were also present.

The minutes of the previous regular Board meeting in November were approved as presented in the December 2003 issue of the Eclipse. President Boyd moved that the Board appoint Bob Rice to the position of Assistant Secretary to perform those duties in the absence of Secretary Jill Thompson. This motion was seconded and approved by unanimous vote. President Boyd also introduced Heinrich Tischler as the new Outreach and Liaison Committee Chair.

President Boyd reported that the Seyfert Lecture held at Vanderbilt University on December 3rd was very successful and that a larger venue would be required next year. He pointed out that the BSAS cosponsored this event with Vanderbilt's Physics and Astronomy Department and Dyer Observatory. Mr. Boyd further noted that the BSAS would have a greater influence in future speaker selection. Mr. Boyd also informed the Board that Nancy Dwyer, Outreach Coordinator at Vanderbilt's Dyer Observatory, had invited the BSAS' officers to attend the observatory's 50th anniversary celebration on December 12th. Mr. Boyd stated that he would also include the BSAS' committee chairs on the list of names to be returned to Ms Dwyer.

President Boyd reported that the Dark Sky Committee, chaired by Powel Hall, had recently met and learned that Metro Nashville apparently has a lighting ordinance regarding the amount of outside light that can spill over. The details and ramifications of this ordinance will require further review.

Hospitality Committee Chair Pam Thomas reported that 26 members had signed up to bring a dish to the Holiday Season Pot-Luck Supper at the Adventure Science Center on December 18th. Ms Thomas suggested that a main course of turkey and ham be purchased from Heavenly Ham pending a review of prices. She noted that announcements about the supper either have or will be made via the Eclipse, the BSAS' website, Yahoo's tnastronomy group, and direct member contacts.

Membership Committee Chair Bill Griswold reported that the BSAS had 169 members, 47 of whom were still receiving the Eclipse by ground mail. He also estimated that 53 members would become delinquent by December 31st unless payments were received soon. Mr. Griswold noted that delinquent members were being informed of their status via the Eclipse. Mr. Griswold also asked for someone to help with the handling of member nametags beginning around February; Pam Thomas volunteered to do this.

Mentoring Committee Chair Janaruth Ford reported that her committee did not meet in November, but that they were developing a survey questionnaire that might be handed out during the Holiday Pot-Luck Supper to gather comments and suggestions. She noted that asking how to use a telescope – particularly go-to telescopes – appeared to be a recurring new member question. A discussion ensued among the group centering on the problems involved in explaining the operational differences among the various go-to scopes.

Program Committee Chair John Harrington reported that the January 2004 program would address the topic of "How to use your new telescope" in anticipation of the many scopes that will be received as gifts during the holidays. Kris McCall stated that she would put information about the January program in the Adventure Science Center's newsletter. Mr. Harrington also told the Board that Loren Ball, who has discovered 138 asteroids, would present the February 19th program on his techniques. Joe Boyd commented that he had arranged for Dr. David Ernst from Vanderbilt to present the March program on "Nervous Neutrinos" or a similarly titled talk on this subject.

Outreach and Liaison Committee Chair Heinrich Tischler told the Board that he would like to work with Nashville's metropolitan government to develop a standard presentation package for the schools. Joe Boyd commented that he had recently been involved in a "sidewalk astronomy" session that could probably be presented on short notice.

Vice President John Harrington reported to the Board on TNSP 2004 noting that this event has been held at Camp Nakanawa near Crossville for the last two years. Mr. Harrington stated that he had reviewed the Camp's contract for 2004 and found two provisions that were highly adverse to the BSAS. In his opinion, one could void the BSAS' liability insurance coverage with the Astronomical League and the second could make the BSAS' signor personally liable for damages or injuries that occurred during the TNSP. Noting that Camp Nakanawa appeared to be resistant to any contract changes, Mr. Harrington suggested that the Board consider Camp Nacome, approximately 90 miles southwest of Nashville toward Centerville, as an alternate site. After discussing the pros and cons, Board members Bill Griswold, Lonnie Puterbaugh, John Harrington, and others as available will make a field trip to

Minutes of the Regular Board Meeting, continued from Page 5

Camp Nacome on Saturday, December 6th if arrangements can be made with the camp operator. They will report back on their findings and observations.

Treasurer Lonnie Puterbaugh provided a written report to the Board showing an October 1st beginning checking account balance of \$5130.43 with income of \$2568.55 and expenses of \$618.58 leaving an ending November 30th balance of \$7080.40. He also reported certificates of deposit of \$2624.61 giving the BSAS \$9705.01 in total monetary assets at November 30th. Mr. Puterbaugh also reported income earned but not received of \$2050 (ALCON) and \$1210 in estimated upcoming expenses. The Treasurer recommended moving our CDs to a money market account to provide a higher rate of return and greater liquidity. Mike Benson put this recommendation into a motion that was seconded by Bill Griswold and passed by unanimous vote following a brief discussion.

Equipment and Facilities Chair Lonnie Puterbaugh recommended that the BSAS purchase two Johnsonian aluminum equatorial platforms for \$1500. Mr. Puterbaugh pointed out that the price had just gone up several hundred dollars, but that the vendor had guaranteed the lower old price to the BSAS through December 15th. These platforms would be available for loan to BSAS members and, being able to accommodate scopes from 4 to 16 inches, would provide greater flexibility in mounting a wide variety of loaner and members' personal scopes. This recommendation was put into a motion, seconded, and after discussion, was approved by unanimous vote. President Boyd observed that our new sound system would be available for the December meeting program.

President Boyd expressed the opinion that members who borrowed the Society's loaner scopes or equipment should be required to bring these items to any upcoming public star parties or otherwise use them for public outreach. Mr. Boyd explained that he had reviewed the websites of several other astronomy clubs and found that they followed a similar policy, which was typically documented by a written agreement. He noted that a BSAS member who was a teacher at Meigs Middle School had recently borrowed the Society's 8 inch Hardin Dobsonian loaner scope and brought it to a school outing for this purpose. Mr. Boyd also commented that he would like to see the BSAS' membership increase to 200 during 2004 and believed that Board members could help accomplish this through personal promotion.

Public Relations Committee Chair Kris McCall reported that her committee would meet on December 8th and noted that they were still working on a BSAS logo. She asked Board members to send any suggestions to her. Janaruth Ford suggested that we might hand out blank paper to attendees at the upcoming Holiday Pot-Luck Supper and ask for their sketches and designs. Ms McCall also submitted a written draft schedule of events for 2004. She recommended that we wait until early April to assess the appearance of two expected comets before promoting events for viewing those objects. The Board also decided not to include private star parties in the schedule. A motion was made to adopt the modified schedule, was seconded, and after discussion, was approved by unanimous vote.

President Boyd announced that he had received notice from an Arizona club about a Messier Marathon to be held in March 2004 and that John Dobson would be speaking to the east Tennessee amateur astronomers group this month. He reiterated the invitation from Nancy Dwyer for BSAS' board members to attend Dyer Observatory's upcoming 50th anniversary celebration.

Since there was no further business, the President declared the meeting adjourned at 9:55 P.M.

Respectfully submitted,
Bob Rice, Assistant Secretary

Minutes for Barnard-Seyfert Astronomical Society Monthly Membership Meeting on Thursday, December 18, 2003

The monthly membership meeting was called to order by Joe Boyd at 8:15 P.M. in the Ingram Auditorium of the Adventure Science Center. The minutes of the last meeting were approved as presented.

Joe Boyd thanked Pam Thomas for planning the Christmas potluck. He also recognized visitors and new members. In addition, he announced that the cost for a Sky and Telescope subscription has increased from \$29.95 to \$32.95, but that those who have already mailed their payment will have it accepted.

Bill Griswold reviewed the new dues structure and urged those with delinquent fees to submit their payment and complete a membership application to update their records.

Tony Campbell was not present, due to the birth of his son, so there was no report from the web master.

Joe also announced that the Wendell Holiday Lecture will be held on February 12 and all members of the BSAS are invited. The BSAS will meet at the Adventure Science Center in January and February as well and Joe

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Minutes of the Regular Membership Meeting, continued from Page 6

expressed a big thanks to Kris McCall for arranging that. In addition, Joe announced that Bob Rice has been appointed Assistant Secretary to replace Jill Thompson when she travels to Guam in February. He also reported that Dudley Pitts is the BSAS historian and will be compiling a history of the BSAS. In addition, Joe reported on the 50th Anniversary celebration of Dyer Observatory. The children on Carl Seyfert were present. The Seyfert family displayed a scrapbook of activities at Dyer and they promised to make photocopies of these materials and give the copies to the BSAS.

It was also announced that we have a new sound system and that our speaker this month, Richard Schmude, would be the first to test it. Without objection, Joe Boyd adjourned the meeting at 8:35 P.M. and gave the floor to Presentations Committee Chair John Harrington. John introduced Dr. Richard Schmude and informally dubbed him "King of the Planet Watchers." Schmude is a professor at Gordon College (south of Atlanta) and Executive Director of the Association of Lunar and Planetary Observers (ALPO). Dr. Schmude discussed what we have learned about Mars in the past year.

Lonnie Puterbaugh arrived later in the evening and, after the speaker ended, gave a treasurer's report. He announced that the present treasury balance is \$7,080.40, which does not include revenue from ALCON. He announced that the next joint meeting of the Equipment & Facilities Committee and the Long Range Planning Committee will be held at 7 P.M. on January 7 at Lonnie's house. The loaner scope policy will be discussed. He also announced that 2 equatorial platforms have been purchased.

Joe announced that the Board has adopted a schedule for the coming year and that it will be printed in the next Eclipse. One of the types of activities planned is "Sidewalk Astronomy" in which telescopes are set up on short notice around the community to get people interested in astronomy. Joe suggested that each person pick up several brochures and give them to someone who is not a member.

Mike Benson announced that the Guy Ottewell calendars have arrived and those wishing to have a copy should see him.

Kris McCall, on behalf of the Adventure Science Center and Sudekum Planetarium, thanked the BSAS for continued support and collaboration. Joe again expressed appreciation to Kris and to the Adventure Science Center for allowing us to meet there.

It was also announced that members should be sure that the potluck food should be cleaned up and that the room should be straightened before everyone left. Joe Boyd also announced a special meeting of the Board to be held immediately.

Respectfully submitted,
Jill Thompson
Secretary

Minutes for Barnard-Seyfert Astronomical Society Special Board of Director's Meeting on Thursday, December 18, 2003

The special meeting of the BSAS Board of Directors was called to order by Joe Boyd at 10:15 P.M. in the Ingram Auditorium of the Adventure Science Center. Board members present were Joe Boyd, John Harrington, Kris McCall, Janaruth Ford, Jill Thompson, Mike Benson, Pam Thomas, Powell Hall, Lonnie Puterbaugh, and Bill Griswold, which made up a quorum. Guest Richard Schmude was also present.

Joe announced that the contract for Camp Nakanawa for TNSP2004 would be discussed. Joe had drawn up another contract, which was also approved by John Harrington. The new contract provides, among other things, better insurance coverage for both parties. Joe will get a copy to all Board members and asked that the Board approve the new contract pending review of the document. Pam Thomas moved to accept the revised contract once all Board members have a chance to review it. Bill Griswold seconded the motion. The motion carried.

Kris McCall moved that the date of the January Board meeting be moved to Thursday, 8 January instead of 1 January. Bill Griswold seconded the motion. The motion carried.

Without objection, the special meeting of the Board was adjourned by Joe Boyd at 10:29 P.M.

Respectfully submitted,
Jill Thompson
Secretary

Activities and Events

January 1 - 31, 2004

- 1/4 Earth at perihelion; Quarantid meteors
- 1/6 Conj., Moon & Saturn
- 1/6 Dark-Sky Committee, 7:30 p.m., at
McKendree Towers, Room 201
- 1/7 FULL MOON
- 1/8 BSAS Board meeting, 7:30 pm at Jefferson
Square, Joe Boyd 386-3134)
- 1/12 Conj., Moon & Jupiter
- 1/14 LAST QUARTER; Conj., Venus & Uranus
- 1/15 B.S.A.S. meeting at Adventure Science Center,
7:30 p.m.
- 1/17 Mercury, gr. elong. west (It's a morning star.)
- 1/19 Conj., Moon & Mercury
- 1/21 NEW MOON
- 1/23 Conj., Moon & Uranus
- 1/24 Conj., Moon & Venus
- 1/27 Conj., Moon & Mars
- 1/29 FIRST QUARTER MOON

February 1 - 29, 2004

- 2/2 Conj., Neptune & Sun
- 2/3 BSAS Dark-Sky Committee, 7:30 pm at 4343
Lebanon Road, Hermitage
- 2/5 BSAS Board meeting, 7:30 pm at Jefferson
Square, Joe Boyd 386-3134)
- 2/6 FULL MOON
- 2/8 Conj., Jupiter & Moon
- 2/13 LAST QUARTER
- 2/13 7:30 to 9:30 pm Winter Star Party: Model air-
plane field at Edwin Warner Park
- 2/14 Valentine's Day
- 2/15 Conj., Mercury & Neptune
- 2/18 Conj., Moon & Neptune
- 2/19 BSAS Membership Meeting 7:30 Adventure
Science Center
- 2/20 NEW MOON
- 2/21 Conj., Uranus & Sun
- 2/23 Conj., Moon & Venus
- 2/25 Conj., Moon & Mars
- 2/27 FIRST QUARTER

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