ECLIPSE

The Newsletter of the Barnard-Seyfert Astronomical Society

Celebrating our 76th Year **February 2005**

Membership Meeting, Thursday February 17th
Adventure Science Center, 7:30 pm

The regular BSAS membership meeting for February will feature Tony Campbell and Mike Benson. Mike will continue his discussion of the Astronomical League and the membership benefits that we as a club receive from the League. Tony Campbell will discuss interesting astronomy software and websites that have proven to be most useful to amateur astronomers.

FROM THE PRESIDENT

By John Harrington

Hello! In this month's column, I'd like to focus on a few basic rules to keep in mind while enjoying star parties. This topic is particularly important, given that we have a practice session for our Messier Marathon scheduled for February 5th, with the real thing to follow on March 5th (with March 12th as a make-up day in case of poor weather).

Before digging into the rules, though, I'd like to point out that the basic idea of a Messier Marathon is to have fun, while learning something and hopefully staying warm! There is no penalty for not seeing all 110 Messier objects, and in fact it requires seeing and describing only 70 objects with a telescope or 50 objects with binoculars to obtain an Astronomical League certificate. So enjoy the experience, and don't worry if you miss seeing some objects or can't stay out all night long.

I hope you were able to attend the last membership meeting and to hear Lonnie Puterbaugh's excellent presentation on Charles Messier (1730-1817) and the Messier objects. In a nutshell, Messier was actually a comet-hunter (and ultimately discovered roughly a dozen comets), but his ironically his greatest renown is for the list he compiled of objects that he believed could mislead comet-seekers. While today's telescopes and even binoculars are far better optical instruments than what Messier possessed, we still remember his list because it is such a fine compilation of the best objects in the northern hemisphere's night skies. The list includes (by my quick count) some 40 galaxies, 28 open star clusters, 29 globular clusters, 12 nebulae and one double star.

OK, let's go through those basic rules for enjoying Messier Marathons and other star parties:

Before the Star Party:

- **Purchase a red flashlight**. One of the pleasures of a star party is observing from a relatively dark sky site that allows our eyes to become dark-adapted . . . but any white light quickly destroys everyone's dark adaptation! Red flashlights are available from various suppliers, including Wal-Mart and REI stores.

- **Bring warm clothes**. Even in the summertime, evening temperatures (especially at remote sites, like the Natchez Trace) can drop further and faster than you think. Jackets, gloves and a knit cap are all essentials for each attendee.

- **Bring warm drinks and food**, for the same reasons as warm clothing.

- **Bring a folding chair or stool**. This makes the hours spent under the stars that much more comfortable.

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- **Leave pets at home**. Many amateur astronomers invest heavily in their equipment, and having a pet knock it over or otherwise damage it is a major no-no.

- **Do not bring any alcoholic beverages to a star party**.

At the Star Party:

- **Try to arrive prior to sunset**—this makes parking easier.

- If you arrive after sunset, **remember to avoid using your headlights** as you enter the star party location. Headlights will destroy everyone's dark adaptation! Use your parking lights instead, drive slowly, and remember to switch off interior lights.

- **Watch your step!** An increasing number of amateur telescopes include electronics, so watch out for wires on the ground.

- **Ask before touching.** The telescope owner may be adjusting his equipment or taking an astro-photo, so please don't touch equipment without asking the owner first.

- **No smoking**. It's bad for optics and electronics, and even worse for your lungs.

- **Keep noise to a minimum**: astronomy is a tranquil experience, best enjoyed in relative silence. While quiet discussion is fine, please do not: (i) play music (tastes differ sharply!), (ii) run a generator or (iii) yell (unless of course you see an Iridium satellite flare or a bright meteor).

- **Don't litter!** It reflects badly on you and on the BSAS.

- **Never, ever aim a laser pointer or laser collimator at another person or at a passing aircraft!** This behavior is extremely dangerous and illegal, and will result in your being asked to leave the star party immediately. Please see the rules for safe laser pointer usage found elsewhere in this issue (and reproduced by the kind permission of Sky & Telescope magazine). Laser pointers have already been banned in the U.K., let's make sure we do our part to avoid this outcome in the U.S.

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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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BSAS Logo by Tony Campbell

Happy Birthday Clyde Tombaugh

by Robin Byrne

This month we celebrate the 99th birthday of a man who will forever be associated with the planet (?) Pluto. Clyde Tombaugh was born on February 4, 1906 in Streaton, Illinois. The eldest of six children, Clyde grew up on the farm. It wasn't until 1922, when his family moved to Kansas, that Clyde got to look through a telescope: a 3" refractor his uncle had made. That was the beginning of Clyde's interest in telescopes and astronomy.

In 1925, Clyde bought the materials to grind his own 8" mirror, which he built into his first telescope, which included parts from old farm machinery and his father's old 1910 Buick. During his lifetime, Clyde built at least 36 different telescopes. In 1928, Clyde built a 9" reflector, which he used to observe and sketch Jupiter and Mars. He sent his best drawings to the Lowell Observatory for some constructive criticism. Instead, he got a job offer to join their team to search for the 9th planet. Clyde joined Lowell Observatory's staff in January, 1929.

The search consisted of systematically photographing the sky near the ecliptic. The same part of the sky would be photographed a few days apart. The two images were then placed in a "blink comparator", which would alternate between illuminating one plate then the next. If all the stars are properly aligned, then only an object that has moved over the few days would appear to "jump" as the plates blink back and forth.

After 10 months of searching, on February 18, 1930, Pluto was found on photographic plates that had been taken January 23 and 29. Clyde was only 24 years old and instantly famous.

In 1932, Clyde took advantage of his new free time to go to college at the University of Kansas. It was here that he met his wife, Patricia Irene Edson. When they were introduced, Clyde was introduced as the man who discovered Pluto. Patricia responded that she loved that cartoon. She thought he worked for Disney! They married in 1934 and had two children: Alden and Annette.

Clyde's interests were not confined to planets. In 1937 he discovered a dense cluster of 1800 galaxies. This led him to hypothesize that galaxies in the universe were distributed in a more clumpy fashion. This was contrary to the then popular belief that everything was evenly distributed. It is now known that galaxies are distributed in clumps.

From 1938 to 1939, Clyde worked on a Master's Degree at Kansas. He was still considered a member of the staff at Lowell, even while he was in school. He stayed at Lowell until 1945. During that time, Clyde cataloged 29,548 galaxies; 3,969 asteroids (775 of which were previously unknown); 2 new comets; one nova; and Pluto. He also held teaching positions at Arizona State College and the University of California at Los Angeles.

In 1946, Clyde moved to New Mexico to hold the position of chief of Optical Measurements Branch in the Ballistics Research Laboratory at White Sands Missile Range, where German V-2 rockets were being tested. In 1955, he moved to New Mexico State University, where he started an astronomy research program, called the Planetary Group. It was largely under Clyde's direction that the school funded a 24-inch telescope at Tortugas Mountain Observatory, which had first light in 1967. The telescope is still being used, by mainly by NASA. In 1970, Tombaugh developed a department of Astronomy at NMSU.

Tombaugh stayed at New Mexico State University until retirement in 1973. However, that was not the end of Clyde's involvement in astronomy. He still regularly attended lunches and colloquia given by the astronomy department, and was an active observer up until shortly before his death. When the Smithsonian Institution in Washington, D.C. asked Clyde to donate his 9" reflector to their historical collections, he refused, explaining, "I'm not through using it yet!" Clyde Tombaugh died January 17, 1997 at the age of 90.

With the recent discoveries of Quaoar and Sedna, the status of whether Pluto is a planet has been put into even more question. However, Tombaugh never stopped declaring that Pluto IS a planet. Clyde Tombaugh should not only be remembered for discovering Pluto, but also for his spirit and enthusiasm for astronomy. Happy Birthday, Clyde!

References:

The New Encyclopaedia Britannica 1995
Notable Twentieth Century Scientists Emily J. McMurray, Ed. 1995
Clyde Tombaugh (1906-1997): Articles: NMSU
http://www.klx.com/clyde/nmsu.html

Barnard-Seyfert Astronomical Society
Minutes of a Regular Meeting of the Board of Directors
Held On Thursday, January 6, 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 January 6, 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 Joe Boyd, Tony Campbell, JanaRuth Ford, Bill Griswold, John Harrington, Bob Rice, Randy Smith, Pam Thomas, and Gary Wilkerson were present. Board members Mike Benson and Kris McCall were absent. In addition to members of the Board, BSAS members Keith Burneson, Ken Mayor, and Lonnie Puterbaugh were also present. The minutes of the previous regular Board meeting held on December 2, 2004 were approved as published in the January 2005 issue of the Eclipse newsletter.

John Harrington expressed concern about the recent reports of green laser pointers being directed at flying aircraft around the country. Mr. Harrington suggested that, although the BSAS did not own any laser pointers, the Society should adopt a written standard regarding their use at sponsored functions. Mr. Harrison offered to draft such a standard. Joe Boyd, who is a pilot, agreed to contact the Federal Aviation Administration and the Civil Air Patrol for guidance. Tony Campbell also suggested that the Board ask Mike Benson, our Astronomical League Correspondent, to contact the League for additional information and suggestions.

John Harrington reported that Kris McCall, who collected the money, informed Treasurer Randy Smith that the silent auction held during last month's holiday pot-luck dinner netted over $200. Mr. Harrington also reported that the Dark Sky Committee, chaired by Powell Hall, met on January 4, 2005. During that meeting the committee discussed the International Dark-Sky Association's (IDA) prototype municipal lighting ordinance. Joe Boyd noted that many IDA members around the country objected to this proposed ordinance because it specified limits on wattage, but not on emitted lumens.

Long Range Planning Committee Chair Joe Boyd reported that this committee would meet on February 10, 2005. Programs Committee Chair JanaRuth Ford reported that this committee would meet on January 13, May 12, and September 8 during 2005. Ms Ford asked for volunteers to participate in or to suggest topics for future programs. Hospitality Committee Chair Pam Thomas reported that the December 16, 2004 holiday potluck dinner held at the Adventure Science Center was quite successful and that we would probably repeat the same format in December 2005. Ms Thomas noted that both the silent auction and the planetarium laser light show were especially well received.

John Harrington reported that the BSAS had signed a contract with Camp Nakanawa to use that facility for the next Tennessee Star Party (TNSP) to be held on October 7-9, 2005. Mr. Harrington noted that the contract provided for an advance party of up to five BSAS members to arrive on Thursday night, October 6, 2005. Mr. Harrington also reported that no one had yet volunteered to chair the Publicity Committee. Webmaster Tony Campbell offered to publish a "job description" of applicable talents, skills, and duties on the BSAS website to possibly spark some interest among the membership.

John Harrington reported that Dr. David Fields was very enthusiastic about hosting a BSAS field trip to the Tamke-Allan Observatory and had obtained approval from Roane State Community College's administration. Mr. Harrington suggested scheduling this field trip for March or April noting that the exact date would have to be coordinated with Tamke-Allan. Mr. Harrington also reported that Vanderbilt University had named a speaker for the Carl K. Seyfert Lecture in Astronomy on January 20, 2005, but with no topic specified. Mr. Harrington said that he would contact Vanderbilt for clarification.

Finance and Budget Committee Chair Bob Rice presented budget recommendations for 2005 that were accepted with slight modification. Joe Boyd moved for the modified budget to be adopted; JanaRuth Ford seconded the motion; and the budget passed by a unanimous voice vote. A copy of the approved budget will be published in the next issue of the Eclipse newsletter.

John Harrington announced that the first TNSP 2005 planning meeting would be held within the next four weeks and that all concerned would be notified of the date by email. Tony Campbell volunteered to draft announcements to the major astronomy magazines and the Astronomical League's Reflector periodical. Mr. Harrington announced commitments from these speakers for TNSP 2005: Asteroid Hunter Loren Ball, Dr. Spencer Buckner (Austin Peay State University), Dr. Chuck Higgins (Middle Tennessee State University), Dr. Robert O'Dell (Vanderbilt University), and Dr. Richard Schmude (Gordon College). Mr. Harrington also announced that Burgess Optical of Knoxville and one other vendor had committed to participate in TNSP 2005. Mr. Harrington said that he would begin asking for volunteers to assist with TNSP 2005 at the next membership meeting.

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Minutes of a Regular Meeting of the Board of Directors, continued from Page 4

Following a brief discussion initiated by John Harrington and Lonnie Puterbaugh, these dates were selected for the upcoming Messier Marathon:

- February 5 – Practice session at the Water Valley Overlook site
- February 12 – Possibly a second practice session following the public star party at Warner Park
- March 5 – Marathon
- March 12 – Alternate date for the Marathon

Further details will be announced at the January 20 membership meeting. Since the program for this meeting will be a series of "how to" sessions by members, Mr. Puterbaugh volunteered to conduct a brief presentation on the Marathon that will include showing well-known astronomy educator David Levy's DVD "How to Do a Messier Marathon." Mr. Puterbaugh said that he would also provide a recommended sequence for observing the Messier objects and display some pertinent reference books.

Lonnie Puterbaugh suggested that NASA's Deep Impact Project, a scheduled launch of a probe from an unmanned spacecraft to impact Comet Tempel 1 on July 4, 2005, might be an interesting viewing event for the BSAS. Although many will conveniently be off from work on or around July 4, Mr. Puterbaugh pointed out that any number of unforeseen circumstances could easily change that date. Several Board members also noted that, even if the event proceeded on schedule, we would probably have to find a site away from holiday fireworks displays.

Lonnie Puterbaugh commented that, with only a $20 admission fee, the Mid-South Star Gaze scheduled to be held near French Camp, Mississippi on April 6-10, 2005 was a worthwhile and reasonably priced event.

Equipment and Facilities Committee Chair Lonnie Puterbaugh reported that that this committee met on January 5, 2005 and adopted two resolutions for recommendation to the Board regarding the acquisition and custody of new equipment. **The first resolution was:**

1. The Equipment and Facilities Committee be authorized by the Board to purchase Coronado Personal Solar Telescope (PST) plus a case, at a total price not to exceed $750; and

2. The Equipment and Facilities Committee be authorized to purchase an EQ2 mount for the above telescope, at a price not to exceed $350; and

3. The above equipment will be in the custody of the Equipment and Facilities Committee to be used primarily in the daytime public outreach efforts, and for the BSAS equipment loan program.

Bill Griswold moved that the Board adopt this resolution; Tony Campbell seconded the motion; and, following a brief discussion, the motion passed by a unanimous voice vote.

The second resolution was:

1. The Equipment and Facilities Committee be authorized by the Board to purchase a six inch (or 152mm) Dobsonian telescope, at a price not to exceed $350; and

2. The Equipment and Facilities Committee be authorized by the Board to purchase a Telrad, with a dew shield, and a carrying case for the above telescope, at a price not to exceed $160; and

3. The above equipment will be in the custody of the Equipment and Facilities Committee for use in the BSAS equipment loan program.

Joe Boyd moved that the Board adopt this resolution; Pam Thomas seconded the motion; and, following a brief discussion, the motion passed by a unanimous voice vote.

Keith Burneson suggested that, because of the noise, using generators should be prohibited at our star parties. John Harrington said that he would draft a set of "Star party etiquette" to be distributed to Board members by email.

There being no further business, President Harrington declared the meeting adjourned at 9:18 P.M.

Respectfully submitted,
Bob Rice
Secretary

Seeing Stars? In This Case, It's a Good Thing

by Terri Likens, Roane County News January 5, 2005

From the earliest times, stars have been important to people.

We have used them to find our way around the world.

We have written about them, sung about them, dreamed about them and wished upon them.

They showed us the way to a heavenly king.

From Virgil to Vincent Van Gogh, Oscar Wilde to the Wise Men, the stars above have inspired humanity every step of the way.

What if we could no longer see them?

In Roane County, we have been lucky to have clear views of the stars when many parts of our country did not. The folks at Roane State Community College realized this when they built the Tamke-Allan Observatory high on one of our hills. We count Tamke-Allan as one of our local jewels.

Our county is rapidly developing and, in the pollution produced by inefficient lighting, those twinkling symbols of inspiration are getting harder to see.

The folks at Tamke-Allen are sounding the alarm, and we should listen.

Luckily, the fix is not a particularly difficult or expensive one.

Other communities that value clear, starry nights have found that education, along with inexpensive shielding that prevents light from escaping from anywhere but its intended subject, can help us meet our lighting needs without obscuring our views of the stars and planets.

Such programs are called Dark Skies Initiatives, and they often start in places with observatories, or where people value the landscape and the nightscape around them.

Here's what they have learned:

Inefficient lighting involves misdirected light — often shining upward — or using more light than is needed to do the job.

It wastes energy dollars and resources, like coal or oil, that are used to produce energy.

Wasting those resources produces additional unnecessary pollution, like the soot produced by the Kingston TVA fossil fuel plant that recently landed part of Roane County on a federal bad-air list.

Inefficient lighting creates glare that makes it harder for drivers and others to see at night.

It causes light trespass — that annoying glare from a neighboring property onto your own.

It creates a cluttered look and can create an unattractive nighttime environment.

The biggest fix is to shield the lights you use at night, directing their glow down to illuminate doorways, sidewalks, parking areas and such. Take care not to lose light to the sky or spill light onto neighboring property.

Many lighting fixtures are already properly shielded. Others can be inexpensively adapted.

What's important is to get community leaders, planners and developers to understand the problem. Then they, and we, can work toward a solution.

As William Shakespeare said, "It is not in the stars to hold our destiny but in ourselves."

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After the Star Party:

- **Clean up any trash you may have left behind**.
- **Remember not to use your headlights close to the star party as you exit.**
- **Stay alert on the drive home. Be especially careful to watch for deer and other animals on the Natchez Trace at night.**

I hope these "rules of the road" will help make our Messier Marathon and other star parties an enjoyable experience for all. I hope to see you on February 5th at Water Valley Overlook (Natchez Trace mile 412) for our Messier Marathon practice session!

Barnard-Seyfert Astronomical Society
Minutes of the Monthly Membership Meeting
Held on Thursday, January 20, 2005

President John Harrington called the meeting to order at 7:41 P.M. at the Adventure Science Center and welcomed new members and visitors. The minutes of the previous membership meeting held on December 16, 2004 were approved as published in the January 2005 issue of the *Eclipse* newsletter.

Several BSAS members presented this evening's program centered on low-cost observing techniques and suggestions for the upcoming Messier Marathon. Steve Wheeler described a Hartmann mask, a device made to fit the end of a telescope like its dust cap with holes cut into it, to be used as a focusing aid with a camera or other imaging device. Everyone was especially delighted to hear how Mr. Wheeler constructed his mask very inexpensively from a Walmart sour cream container lid!

Next, John Harrington presented guidelines for planetary observing that touched on seeing, thermal equilibrium, and optics and collimation. Mr. Harrington also suggested internally lining telescope tubes with flocking paper to provide better contrast by eliminating stray light. Other recommendations included aiming high (above 40 degrees) for less atmospheric turbulence along with suggestions for eyepieces, filters, and Barlow lenses.

Lonnie Puterbaugh then described three useful and inexpensive devices that could be constructed by amateurs: (1) a telescope dolly made from plywood, castors, and other hardware; (2) a solar finder made from a small PCV pipe; and (3) an amazingly simple but effective pneumatically powered (via an inflated inner tube) equatorial platform. Humorous visual and audio clips of well-known characters such as Darth Vader and Gomer Pyle highlighted Mr. Puterbaugh's automated presentation.

Lonnie Puterbaugh, as the Equipment and Facilities Committee Chair, announced that a six-inch Dobsonian telescope and a Coronado Personal Solar Telescope (PST) would soon be available as part of the Society's loaner program. Mr. Puterbaugh asked the membership for a donation of a suitable EQ2 or equivalent mount for the PST. He also recommended The Mid-South Star Gaze to be held near French Camp, Mississippi on April 6-10, 2005 with only a $20 admission fee as a worthwhile and reasonably priced event.

Lonnie Puterbaugh next offered suggestions for participating in the BSAS' upcoming Messier Marathon scheduled for March 5 with an alternate date of March 12 at the Water Valley Overlook site off the Natchez Trace Parkway. Noting that the observer's main adversaries were not only dew and the sun, but also fatigue, Mr. Puterbaugh heartily recommended dressing warmly in layers and bringing something to eat. He also suggested a detailed observing sequence to successfully catch all 110 objects before they either set or were obscured by the rising sun. In addition, Mr. Puterbaugh highly recommended H.C. Pennington's *The Year-Round Messier Marathon Field Guide* as the best reference book for this event. He further commented that the Cosmos I solar sail spacecraft was scheduled to be launched on March 1 and should be in good view for the alternate Marathon night of March 12-13.

Mike Benson, the BSAS' Astronomical League (AL) Correspondent or ALCor, described the AL's Observing Club award programs for viewing the Messier objects with either binoculars or a telescope. Mr. Benson went over the reporting form for these programs noting that using a go-to mount was not permitted, but that using a Telrad or a regular finder was allowed.

John Harrington recalled the meeting to order at 9:27 P.M. and announced these upcoming events of interest:

- February 5: Messier Marathon practice session;
- February 12: Public Star Party at Edwin Warner Park;
- Date To Be Determined: Field trip (tentative) to Tamke-Allan Observatory at Roane State Community College;
- April 2: Public Star Party at Edwin Warner Park at 8:00 P.M.;
- April 6-9: Mid-South Star Gaze at Rainwater Observatory, French Camp, Mississippi; and
- April 16: Astronomy Day at Adventure Science Center from 10:00 A.M. to 3:00 P.M. followed by a star party at 8:00 P.M.

Mr. Harrington asked for volunteers to assist with the Tennessee Star Party to be held at Camp Nakanawa near Crossville on October 7-9, 2005. Treasurer Randy Smith reported that the BSAS' checking account balance was $5,805.17 plus $195.00 just received from last month's silent auction that had not been deposited. Mr. Smith also announced that he still had *2005 RASC Observers Handbooks* for sale.

Dark Sky Committee Chair Powell Hall reported that this committee would next meet on Tuesday, March 1. Mr. Hall also reported that the International Dark-Sky Association's (IDA) annual meeting would be held in Tucson, Arizona in April, but unfortunately, at the same time as The Mid-South Star Gaze. Mr. Hall encouraged everyone to join the IDA.

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Minutes of the Monthly Membership Meeting, continued from Page 7

Bill Griswold announced that any member who didn't have a name tag could see him after the meeting to have one made.

ALCor Mike Benson announced that the Astronomical League's Executive Council had proposed a multiple tier system for constituent clubs to enroll their members in the League. This proposed system also involved different fees for each tier and a decision for or against the proposal be was to be communicated back to the League by each member club's ALCor. Following a brief discussion, the Board of Directors agreed to undertake this matter at their next meeting.

Mike Benson announced that the Middle Tennessee Science & Engineering Fair would be held in mid-to-late February at Austin Peay State University. This fair provides a venue for mid-state junior and high school students to develop and display projects in the sciences and technology. Mr. Benson noted that the BSAS had previously donated $100 and $50 as first and second place prizes for deserving projects in astronomy. Powell Hall moved that the Society again provide prizes in these amounts for 2005; Ed English seconded this motion; and it passed by a unanimous voice vote without further discussion.

Kris McCall reminded the group about Astronomy Day on April 16 at the Adventure Science Center. With assistance from Ed English who handsomely modeled a sample, Lonnie Puterbaugh announced that TNSP 2004 t-shirts were on sale for $10 each. Mike Benson also announced that he had copies of Guy Ottewell's Astronomical Calendar 2005 available for $21 each.

Since there was no further business to consider, President Harrington declared the meeting adjourned at 9:47 P.M.

Respectfully submitted,
Bob Rice
Secretary

Some Pointers on the Use of Laser Pointers

By Richard Tresch Fienberg

This is a typical amateur-astronomer's green laser pointer, shown with a simulated beam. The 5-milliwatt laser is powered by two AAA batteries and emits an intense, narrow beam of light at a wavelength of 532 nanometers. At night the beam is visible for hundreds or even thousands of meters, depending on sky conditions. Devices like this can be purchased for less than $100 from many sources.º*Sky & Telescope photo by Craig Michael Utter.*

A recent addition to the backyard astronomer's toolkit has been flagged as a potential weapon in the terrorist's arsenal. The humble laser pointer, used by thousands of skygazers to show beginners the way to stars and constellations, is coming under fire from US federal and state authorities following several recent incidents in which laser beams have "painted" aircraft in flight.

In the most notorious case, on January 4, 2005, a New Jersey man was arrested after allegedly shining a laser at a small passenger jet on approach to a nearby airport. The suspect claims he had been showing his daughter around the night sky, using his laser pointer to direct her gaze at particular stars and planets. Now he faces a possible jail term and six-figure fine. The incident sparked a media frenzy, with many articles appearing alongside other news from the War on Terror.

Depending which newspapers you read or which television stations you watch, you may hear that handheld laser pointers — commonly available for less than $100 from a host of retailers and online dealers — are either perfectly harmless or capable of bringing down a jumbo jet. Naturally, the truth lies somewhere in between. Used properly, laser pointers are quite safe. But used improperly or maliciously, they can be dangerous indeed.

Here is some basic information about the laser pointers typically used by amateur astronomers, along with some tips on using them safely.

Laser-Pointer Basics

The pointers favored by stargazers use a neodymium diode laser and emit a green beam at a wavelength of 532 nanometers. At a given power setting, such lasers appear much brighter than the older helium-neon lasers, which produce a red beam at wavelengths longer than 630 nm. The reason is simple: the human eye is much more sensitive to green light than red light.

Except on nights of exceptional clarity and near-zero humidity, if you shine a green laser pointer into the sky, you can follow the beam hundreds of meters up. To you and anyone standing around you, it looks like the beam ends at whatever star or planet you're aiming at. This makes it really easy to show someone a particular celestial object. Just point the laser at it and say, "Look there!"

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Some Pointers, continued from Page 8

Most laser pointers shine only as long as you hold down a button. But some models have a "constant-on" setting. These are becoming popular as pointing aids for telescopes. Once the laser is mounted and coaligned with the scope, you just move the scope around till it's pointing at your target star, and when you look in the eyepiece, there it is!

The green laser pointers in common use among astronomers and the general public have a power output of 5 milliwatts. Compared with incandescent light bulbs, which draw tens to hundreds of watts (not milliwatts), this sounds like very little. But laser light is highly concentrated into a very narrow beam. Moreover, this beam is highly collimated, meaning it diverges (spreads out) very slowly. Laser pointers typically emit a beam about a millimeter in diameter. Even as far as a kilometer away, the beam is no more than a meter across.

According to engineer Samuel M. Goldwasser, who maintains an extensive Web site about lasers called Sam's Laser FAQ, if you were to look directly into a laser-pointer beam from a mile away, it would appear as bright as a 100-watt bulb seen at a distance of less than 100 feet. Most people would find such a bright light very uncomfortable and would instinctively blink and/or turn away.

Lasers used in industrial applications and outdoor light shows are vastly more powerful than personal handheld units. There is no question that such lasers can be harmful to pilots, so their use is regulated, and airline pilots are trained to avoid them. The problem with personal laser pointers is that there are millions of them in consumers' hands, and there is no way to guarantee their safe use. In many states, it is already a misdemeanor to shine a laser pointer at a person or vehicle. Now that these devices are being talked about in the context of airplanes and terrorists, there's a very real chance that they will be outlawed. Indeed, 5 mW green lasers are already banned in the United Kingdom.

Safety First

Direct viewing of a laser-pointer beam, even briefly and at a distance of a kilometer or two, has the potential to cause temporary flashblindness — the same effect you get right after a flash photo is taken — or afterimages. These effects last anywhere from seconds to minutes. Glare, which is a reduction or loss of central vision, lasts only as long as exposure to the beam. All these effects could be disastrous if they struck a person operating machinery, driving a car or truck, or flying a plane. Fortunately, there have been no reports of laser-related accidents of this type so far.

To help keep it that way, we offer the following safety tips for amateur astronomers and anyone else using a laser pointer. These are based on suggestions from the Laser Institute of America: Laser pointers are designed to illuminate inanimate objects.

- Never shine a laser pointer toward any person, aircraft, or other vehicle.
- Never look directly into the beam of a laser pointer of any type.
- Do not allow children to use a pointer unsupervised. Laser pointers are not toys.
- If your telescope is equipped with a laser pointer that has a "constant-on" setting, do not leave the instrument unattended with the laser switched on.
- Do not aim a laser pointer toward mirrors or other shiny surfaces. The reflected beam may inadvertently strike someone in the eye.
- Do not aim a laser pointer skyward if you hear or see an aircraft of any kind flying overhead.
- Be aware of irresponsible uses of pointers so that the psychological effect will be minimized if you happen to be illuminated by one.
- Do not purchase a laser pointer if it does not have a "caution" or "danger" sticker on it identifying its class. Report suspicious devices to the authorities.

"Green laser pointers are the best way we have found to point out objects in the night sky to the public," says Monty Robson, a commercial airline pilot and avid amateur astronomer. He regularly conducts observing sessions for high-school students and their families at the John J. McCarthy Observatory in Connecticut. "I would be very disappointed," Robson adds, "if these useful educational tools became restricted by law." Amateur astronomers can help minimize the risk of such an outcome by using common sense, following the safe practices outlined above, and educating others about the safe use of laser pointers.

This article is taken, with kind permission, from the Sky & Telescope web site, http://skyandtelescope.com but without photos.

Activities and Events

February 1 – 28, 2005

2/2 LAST QUARTER
2/3 Conj., Sun with Neptune & Moon with Antares; BSAS BOD, 7:30
2/5 Conj., Moon, & Mars
2/5 Messier Marathon Practice, Natchez Trace, Water Valley Overlook, 6:30 – 10:30
2/8 NEW MOON
2/9 CHINESE NEW YEAR
2/12 Public Star Party at Percy Warner Park, 7:30 – 9:30
2/12 Messier Marathon Practice (rain), Water Valley Overlook, 6:30 – 10:30
2/14 Conj., Venus with Neptune; Mercury at sup. conj.
2/15 FIRST QUARTER
2/17 Monthly BSAS meeting, 7:30
2/18 75th anniversary of the discovery of Pluto
2/20 Conj., Moon & Saturn
2/22 Venus at aphelion
2/23 FULL MOON
2/25 Conj., Sun & Uranus
2/27 Conj., Moon & Jupiter

March 1 – 31, 2005

2/1 Dark-sky committee, 7:30 p. m., 201 McKendree Towers, 4343 Lebanon Pike, Hermitage, Tenn.
2/3 LAST QUARTER; BSAS Board of Directors Meeting, 7:30 p. m.
2/5 Messier Marathon Practice, Natchez Trace, Water Valley Overlook, 6:30 – Sun up
2/6 Conj., Mars & Moon
2/7 Conj., Neptune & Moon
2/10 NEW MOON
2/11 Conj., Mercury & Moon
2/12 Greatest eastern elongation of Mercury
2/12 Messier Marathon Practice (rain), Water Valley Overlook, 6:30 – Sun up
2/17 FIRST QUARTER; ºBSAS membership mtg., 7:30 p.m. Action Science Center
2/19 Conj., Moon & Saturn
2/20 Vernal Equinox, 6:33 a. m.
2/25 FULL MOON
2/26 Conj., Jupiter & Moon
2/27 EASTER DAY º(first Sunday after first full moon after Vernal Equinox)
2/29 Inferior conj., ºMercury & Sun
2/30 Conj., Moon & Saturn

Note: all dates & hours according to Central Time

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