



# ECLIPSE



*The Newsletter of the Barnard-Seyfert Astronomical Society*

November 2001

## PRESIDENT'S MESSAGE

I was at Fall Creek Falls State Park every day, Thursday through Sunday, of our Tennessee Star Party 2001 in October and I wish to comment on it here.

First, many B.S.A.S. members and others planned, worked, and served to make possible the outstanding week end we had together. My only hesitation in naming names is the certainty I should miss some. So I shall mention just a couple. Rocky Alvey again this year was the mother who gave birth to this baby! Lloyd Watkins, at whose home the B.S.A.S. board met in October for the final planning session before TNSP, devoted many hours and much labor toward having food on hand. And there were many others, including the speakers, whose talks I not only enjoyed but also borrowed from a week later in a sermon I delivered in Maryland.

One couple not at this year's star party was Ivonne and Roger McManus. They were a big part of TNSP 2000 but are currently moving back to New York. We missed them and wish them well as they move.

Second, the weather was well-nigh perfect. Unlike last year's star party, at which it rained on Saturday evening, this year's star party, had such clear skies that many stargazers preferred to stay by their telescopes rather than come inside for food! As a result, we ended with more of the food not eaten. We were glad and grateful for good skies.

My own plan was to look through as many telescopes and see as many nebulae, double stars, planets, Jovian satellites, clusters, and other objects as I could. A severe illness nipped this plan in the bud. I had a bad throat, lost my voice and stayed in my room at night. So, despite all my hopes, I looked through not a single telescope the entire week end. Nevertheless, after going to bed early Thursday evening and sleeping, I woke about 11:30 p.m., put on my wool bathrobe, and went onto the balcony facing the lake. With hardly any light pollution and with no moon, I saw the splendid stars of winter filling the eastern sky: Capella, Castor and Pollux, Procyon, Sirius, Betelgeuse, Rigel, Aldebaran, Pleiades, etc. And in their midst, Saturn between the horns of the bull and Jupiter in Gemini. It was magnificent and soul satisfying. I returned to bed. Then, early Friday morning at 4:45 I was up again and out on the balcony. The winter stars had gone from the eastern sky over the lake. But, standing on its handle was the Big Dipper, as clear as I've ever seen it, and to the right Leo the Lion with the pickle above and the triangle below. A memorable night!

Powell Hall

## HAPPENINGS & EVENTS

November 1 - November 31, 2001

11/1 Mercury Venus and Spica close together

11/3 Conjunction of Moon & Saturn

11/4 Conjunction of Mars & Neptune

11/6 Conjunction of Moon and Jupiter

11/8 **LAST QUARTER MOON**; Public Night at Dyer Observatory

11/10 BSAS Private StarParty, Natchez Trace Site

11/15 **NEW MOON**; **BSAS Meeting, 7:30 p.m. at Dyer Observatory, Speaker Chuck Schlemm speaking on the International Space Station**

11/17 BSAS Private StarParty, Natchez Trace Site. Leonid Meteors begin on the 17th and continue on the 18th

11/20 Conjunction of Moon & Neptune

11/21 Conjunction of Moon & Mars; Conjunction of Moon & Uranus; Alpha Monocerotid Meteors

11/22 **FIRST QUARTER MOON**; Thanksgiving Day

11/26 Conjunction of Mars & Uranus

11/30 **FULL MOON**; Occultation of Saturn by Moon

## MAGAZINE SUBSCRIPTIONS FOR BSAS MEMBERS 2001

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** : \$29.95

**ASTRONOMY** : \$29.00

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

BSAS  
Dyer Observatory  
1000 Oman Drive  
Brentwood, TN 37027

## 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 are \$20.00 per year for Regular and Family membership and \$15.00 per year for Seniors (over 60 years of age), and \$10.00 for Students (under 22 years of age). Please call the Dyer Observatory (373-4897) if you have questions. Dues can be sent to:

BSAS c/o Dyer Observatory  
1000 Oman Drive  
Brentwood, TN 37027

## THE ECLIPSE NEWSLETTER

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### Challenge of the Month *Comet Linear Wm1*

This comet will be found in the northeastern part of Perseus in early November. It will steadily move southwest, gradually brightening until it reaches an estimated peak of mag 5.5 in early December. For an ephemeris showing this comet's current position see the December 2001 "Sky & Telescope" Magazine, page 101, or go to this website - [www.harvard.edu/iau/Ephemerides/Comets/index.html](http://www.harvard.edu/iau/Ephemerides/Comets/index.html)

Have fun and let us know about your observations.  
Rocky Alvey

### October Board of Directors Meeting Focus

By Bill Hayden

The BSAS Board of Directors met October 12 at the home of member Lloyd Watkins. Present were Mike Benson, Joe Boyd, Lloyd Watkins, Powell Hall, John Bradford, Bill Hayden, Rocky Alvey and Lonnie Puterbaugh. Final planning for TNSP 2001 was the chief topic. Two resolutions were also adopted:

- 1) The office of vice chair of the Board of Directors was established. Duties are to preside over the board meetings in the absence of the chair. Joe Boyd was elected to and assumed this office.
- 2) BSAS was authorized to file, with the Internal Revenue Service, an Application for Recognition of Exemption under Section 501(c)(3) of the Internal Revenue Code. BSAS officers were empowered to take the required steps to accomplish this. Attorney and Board Member Joseph M. Boyd, Jr. was designated attorney for the corporation, and authorized to sign and submit all required documentation to obtain the Recognition. (This will have the effect of granting BSAS not-for-profit status; application fees will be paid out of BSAS funds.)

Board Meetings are generally scheduled for the first Thursday of each month at 7 PM at the Cumberland Science Museum. There can be changes to this, sometimes at short notice. Contact Chair Kris McCall or other Board member for information. These meetings are open to all BSAS Members.

### Schedule at Sudekum Planetarium November 1 through 30, 2001

NOTE: the Cumberland Science Museum and Sudekum Planetarium will be closed on Thanksgiving Day, Thursday, November 22

#### Tuesday through Friday

3:15 The Light-hearted Astronomer

NOTE: Friday, November 23

11:30 Santa Snork Saves the Seasons

1:00 The Light-Hearted Astronomer

2:30 Santa Snork Saves the Seasons

3:30 The Light-Hearted Astronomer

#### Saturday

11:30 Santa Snork Saves the Seasons

1:00 Skies Over Nashville

2:30 Santa Snork Saves the Seasons

3:30 The Light-Hearted Astronomer

#### Sunday

1:30 Santa Snork Saves the Seasons

3:30 The Light-Hearted Astronomer

#### Skies Over Nashville

Many people are intimidated by astronomy and the night sky. This show highlights those constellations and planets that can be seen from backyards throughout Middle Tennessee and across the United States. If you can "connect the dots", you can draw star pictures. Skies Over Nashville is an excellent way for the entire family to get ready to go out and look at the real sky.

#### The Light-Hearted Astronomer

This laid-back look at the night sky provides both information and inspiration for anyone to become an astronomy enthusiast. Basic steps to start exploring the universe and how NOT to buy a telescope are highlighted along with a healthy dose of down-home humor and the pure enjoyment of the beauty of the sky.

#### Santa Snork Saves the Seasons

When we go out to look at the winter constellations, why is it cold and sometimes snowy? Is it like this everywhere on Earth, and more importantly, why does the Earth have seasons? Planetary Investigator Sam Snork not only saves the seasons, but he also presents an alien interpretation of "A Visit From Saint Nicholas".

NOTE: Our monthly star charts and related articles can be downloaded from [www.SudekumPlanetarium.com](http://www.SudekumPlanetarium.com)

For additional and updated information:  
call AstroLine at 615-401-5092  
or go to [www.SudekumPlanetarium.com](http://www.SudekumPlanetarium.com)

The Barnard-Seyfert Astronomical Society would like to thank **BURGESS OPTICAL** for the generous contribution of a 6" German Equatorial Telescope and several eyepieces as TNSP 2001 door prizes.



**Congratulations Aaron Grissom! TNSP 2001 Grand Prize Winner**

## **BURGESS OPTICAL**

Your place for the finest in custom optical products as well as the highest quality import telescopes and accessories.

**Burgess Optical Company**  
Bill@burgessoptical.com  
Knoxville, Tennessee 37931  
phone: (865) 769-8777

## TNSP 2001...my most awesome astronomy weekend in a very long time!

I didn't get much sleep at all, but TNSP 2001 was incredible. The guest-speaker programs were great. The skies were great. The vendors were great. And most of all, the people attending were great!

I, in particular, had a rare learning experience with some new technology. It's new to me anyway. I took the opportunity to learn about CCD (charge-coupled device) electronic imaging. The gentleman that brought the 36" Newtonian truss-tube dob last year, Tut Campbell, was there again. Those that attended last year may remember him, and I know they remember the scope and the 12' ladder! This year he was teaching (and coaching) CCD imaging live on the field. I use the word "coach" because my perception is that most teachers pass on pure knowledge only, while a good coach will pass on a little knowledge and a lot of passion and excitement. I love learning from people who are passionate about what they teach.

I purchased my Takahashi short focal-length refractor specifically for doing photography and imaging. I have been less than impressed with film imaging due to my home location, with the mall 2 miles to my south, and church parking lot lights next door to me. The 14 airliners flying low overhead during a one-hour exposure haven't helped either. Tut has convinced me that CCD is definitely the way to go. Exposure times are closer to 1-2 minutes for black & white imaging. While the up front cost of CCD seems formidable, the constant cost of purchasing and developing film adds up to a large amount also, especially when the time difference gets added in for actually taking pictures and for driving to and from the camera shop. Add on to this the fact that many of those pictures don't even turn out and that CCD cameras can be purchased "used" for a greatly reduced cost, and CCD costs begin to look competitive. One more benefit is that a lesser mount is required and perfect polar alignment isn't even necessary. Then there's the big one...you can do CCD imaging in LIGHT POLLUTED skies! The only current disadvantage of CCD, other than initial cost, is limited field-of-view. Film photography will currently yield a much wider field-of-view on short focal length scopes. This is changing quickly though as chip sizes are doubling each year or so and cost is remaining nearly the same. For those that think of a 20" telescope as a back-breaker that would rarely get used, a CCD camera and an 80mm refractor will outperform it on nearly everything! CCD cameras can "see" to 18<sup>th</sup> magnitude in one-minute exposures in a standard 8"/f10 SCT! Performance increases will continue with new advancements. I expect that CCD cameras will be able to go to 20<sup>th</sup> magnitude in a one-minute exposure within another year or two in a 4" scope as efficiencies increase.

We used my new servo-equipped "go to" William Yang mount to make aiming the camera much quicker. On Friday night we used Lloyd's Meade 7"/f15 Maksutov with a reducer to bring it to about f12 or 84" of focal length. This somewhat matched up the focal length of Lloyd's scope with the pixel size of the Santa Barbara Instrument's Group (SBIG) ST-6 camera that Tut brought. The reducer saved exposure time and gave us a wider field-of-view to work with also. Tut brought a 486-computer running Windows 98, but with the DOS window open. Yes, we used DOS to do this! The link to the camera on the ST-6 is RS-232 (serial). The newer cameras use a parallel or USB connection. By the way, the ST-6 cameras go for around \$1200 used on Astromart. This is about as cheap as it gets in CCD unless a homemade cookbook camera is used with lesser capabilities. A 486 laptop may go for around \$100 used.

Tut made a cardboard 2-hole mask to aid in the focusing, which takes a while. Once the camera is focused, removing it to look through the scope is not a good option. We didn't have much of a finder scope on the Mak, so we relied heavily on the "go to" mount.

The Dumbbell Nebula, M27, was our first target. It miraculously appeared on the 486-laptop screen in just 15 seconds. We did a 45 second exposure for an enhanced image and then Tut was off to the races. He was amazing in how fast he was imaging galaxies. He was actually doing astronomical work, by looking for supernovae in these galaxies, while showing me and a few others how to do CCD work. He brought images with him that he made prior to TNSP and was comparing them for new "bright dots". Finally he asked me what I wanted to go after, and I having never actually seen it yet through any telescope replied, "The Horsehead Nebula - B33". My Vixen Sky Sensor computer doesn't have a catalog for the Barnard dark nebulae, so we had to use the RA and DEC coordinates from an atlas to get there. No one at the party could visually see this object, but when we pushed the buttons on the computer and 60 seconds had elapsed...Kabam!...the horsehead in all it's glory appeared on our screen! Amazing! It appeared to look very much like an image I had seen as a child from the 200-inch Mt. Palomar telescope with film photography. Now remember that these images were raw, unstacked, and unprocessed digital images! I was hooked!

By late Saturday evening, I was using the camera myself and Tut went to get some sleep around midnight. My Tak FSQ-106N was utilized at f8 or 33.5" of focal length. This doesn't match up well with the large pixel size of the ST-6, but the images were still just plain incredible, especially some images of our sister galaxy, M33. The stars in the Tak/ST6 combo appear somewhat square from using a camera with a large pixel size. I played around with it a bit on various objects, but once again I just had to take my little 4" scope and point it at the horsehead. I took a 90-second exposure of the horsehead and captured a wonderful image. Here I was using a new technology by myself, that had just been presented to me the night before. I wasn't spending more than about 5 minutes total per image and I was getting images that most film photographers would be in absolute awe of. I finally went to bed around 4am after staying up until 5am the night before.

Continued on page 5



**TNSP 2001...** continued from page 4

Several of the BSAS club members were joking that this weekend will cost me a lot more than the \$30 attendance fee. They're right, but I was going to get into this eventually anyway and I feel like I received many times that \$30 in training and life experience. This training will aid me in making a well-informed decision when I do take the plunge and will end up saving me some money in the long run.

This year, there were at least (3) solar setups that were of the hydrogen alpha type. Tut brought a small, but powerfully equipped refractor with a Daystar hydrogen-alpha solar filter. It shows solar prominences and much more surface detail than any white light filters. Paul Lewis had his 8" SCT equipped with a Daystar filter and Rocky had Dyer's Coronado Helios I there. They were all showing images of the sun that are rare to most of us. The views were provided free by those mentioned.

I personally want to thank Bill Burgess for his fantastic gift of a 6" equatorial-mounted Newtonian as a door prize. A very lucky student won it. Bill has some outstanding prices on amateur astronomy equipment.

While I didn't actually purchase one, the CATSEYE collimation system by Jim Fly, looked like a great way to collimate a Newtonian telescope for much lower cost than a holographic laser. It's comparable to a Cheshire in cost, but can be used at night after setup and cool-down has occurred.

Some of you may be interested in knowing that Tut is returning to Nashville in March and I believe he will be the guest speaker at the BSAS monthly meeting. I hope to be imaging with a CCD camera myself before then, but who knows?

Life is fun when you get to be a kid again. I had the most "candy" I could stand at TNSP 2001! It was cold, dark, and damp, and yet it was the most fun anyone could have for \$30. When can I go again?

Lonnie Puterbaugh

### HOT FLASH

by Jerry Lappin

One of the grand experiments lost when Mir was deorbited was an investigation of growing grain in space. Never one to let a useful scientific hint go by with exploring its avenues for profit, Dr. Zarkov put his mighty brain into gear on this bit of information. A poll showed that many gardeners have been very frustrated by earthly problems--drought, floods, bugs, fungi, weeds and back breaking labor--involved in gardening in the back yard. He has come up with a plan for orbiting space gardens, which avoid all of these problems. A typical Zarkov Garden Satellite will provide a number of quarter acre plots suitable for growing any of the common garden vegetables. Orbits will be chosen to allow offering for temperate climate or tropical climate types of plants. Other orbits will provide for such cold, short season vegetables as cabbage, broccoli, and collards. All plots will be offered with automated planting, water recycling, fertilization, and harvesting. Communications uplinks will enable each gardener to select his own mix of vegetables. When a particular crop reached its optimum maturity it will be harvested, carefully packed into suitable containers and returned to the individual gardener by means of a small reentry vehicle. It will even be possible to utilize some of the reentry heat to cook selected vegetables to the appropriate state of doneness. Longer-range plans include providing orchard satellites which will permit growing various varieties of fruit under optimum conditions. Single season rates or long term leases will be available. Consult your local agricultural agent about the availability of space gardens in your area.

### DON'T MISS THE LEONIDS NOVEMBER 17-18

Peaking between 1:00 a.m. - 4:30 a.m. Sunday Morning. Many BSAS Members will observe this event at the Natchez Trace Water Valley location. To estimate the shower intensity at your location, see - <http://www-space.arc.nasa.gov/~leonid/estimator.html>

**Deadline for articles and news items for December ECLIPSE: 25 November**

## Happy Birthday James Clerk Maxwell

by Robin Byrne

This month we honor a man whose discoveries ultimately changed society. James Clerk Maxwell was born November 13, 1831 in Edinburgh, Scotland. The family soon moved to Glenair, where Maxwell was raised in the country. Even as a child, he had an inquiring mind. At the age of 3, he constantly asked his father how everything worked, including locks, bell wires, and plumbing. His parents originally planned to educate him at home, but after his mother died, when Maxwell was eight, the plans changed. First a tutor was hired, but he was a failure. So the family moved to Edinburgh to live with his aunt, where Maxwell could attend the Edinburgh Academy.

At the age of 14, Maxwell wrote his first scientific paper, in which he derived a generalized equation for all oval shapes. In 1850, Maxwell entered college at Trinity, in England, and graduated with a degree in Mathematics in 1854. Maxwell then went to Cambridge. Here he laid the groundwork for one of his greatest discoveries. He found that electric and magnetic fields could be described with just a few, relatively simple equations. This work was published in two parts in 1855 and 1856.

It was in 1856 that Maxwell's father became ill, and James wanted to be close to home, so he applied for an open position at Marischal College in Aberdeen, Scotland. He and his father were able to spend some time together and go on a small trip before his father died on April 3. In November, Maxwell was hired for the position at Marischal.

In 1857, St John's College announced a new competition for the Adams Prize. The topic was "The Motion of Saturn's Rings." Maxwell decided to work on it. He showed that the only way the rings could be stable is if they were composed of numerous small, solid particles. We now take for granted the idea of the rings being composed of dust and ice, but Maxwell first discovered this. Naturally, he won the prize.

In June of 1859, Maxwell married Katherine Mary Dewar. Although her father was the Principal of Marischal College, Maxwell was let go when the school combined with King's College and some of the faculty positions were cut. Some of his difficulty in getting teaching positions may have been due to his reputation of being unsympathetic with weak students. For those who were strong students, Maxwell was considered an excellent lecturer, but everyone else was lost.

In 1860, Maxwell was hired by King's College in London, where he stayed for six years. In 1862, Maxwell calculated that an electromagnetic wave travels at the speed of light. He then made the important conclusion that visible light is merely a form of electromagnetic radiation that our eyes can detect, but that there should be other forms at wavelengths other than visible light. He also worked on the kinetic theory of gases, where he found that the phenomena of heat and temperature are nothing more than measurements of the motions of molecules. The faster the gas molecules move, the higher the temperature. This radically changed how people thought of heat and how heat flows.

Maxwell returned to Scotland in 1865, but then reluctantly accepted a position at Cambridge to be the first Cavendish Professor of Physics in 1871. In 1873, Maxwell published the results of work he had been doing prior to moving to Cambridge: four equations showing the interrelations between electric and magnetic fields. These equations are now known as "Maxwell's Equations." Maxwell's Equations are considered one of the most important accomplishments of the 19th century. Albert Einstein said, "The special theory of relativity owes its origins to Maxwell's Equations of the Electromagnetic Field." Modern technology such as television and radar are the result of Maxwell's discovery.

In the spring of 1879, Maxwell's health began to deteriorate. He and his wife, who was also ill, returned to Scotland for the summer. His health did not improve, although his spirits remained high. They returned to Cambridge in October, and James Clerk Maxwell died on November 5 of that year.

Carl Sagan once said that if someone in the late 19th century had offered a substantial sum of money for someone to discover a way to transmit images through the air and then display them in a box, no one would have been able to do it. However, allowing someone like Maxwell to follow an esoteric line of thinking that ultimately led to his equations of electromagnetism, we have the unexpected result of the technology of television. It is a classic example of how important science for science's sake can be. You can't plan a major discovery or how useful it will be. All you can do is allow people like Maxwell to follow their personal interests, and something amazing is bound to come of it. Regardless of what you may think of the quality of television programming, there's no denying that Maxwell's discoveries are phenomenal.

## References:

Maxwell Web Page

<http://www-groups.dcs.st-andrews.ac.uk/~history/Mathematicians/Maxwell.html>

Untitled Web Page about Maxwell

<http://www.phy.hr/~dpaar/fizicari/xmaxwell.html>

Who was James Clerk Maxwell? James Clerk Maxwell Foundation Web Page

[http://www.ma.hw.ac.uk/icms/jcmpages/pages/who\\_was\\_jcm.htm](http://www.ma.hw.ac.uk/icms/jcmpages/pages/who_was_jcm.htm)