

# ECLIPSE

*The Newsletter of the Barnard-Seyfert Astronomical Society*

June 2001

## PRESIDENT'S MESSAGE

Don't miss seeing Mars! Look to the southeast in the late evening (10:00 or later); you can't miss it. As I write this I have just come in from a late night session in my backyard Saturday, June 2 (actually an early morning session June 3!) Even with my small telescope (90-mm reflector) in light polluted Nashville the views were great with lots of detail. This was the first clear Saturday night in months and the moon was bright but the seeing was good.

As you know, Mars is near opposition when the Sun, Earth and Mars all line up. This occurs approximately every two years because Mars's trip around the Sun takes about two Earth years. However, Mars has an elliptical orbit so some oppositions occur when Mars is much closer to Earth than others. This year's is the closest in over a decade.

Remember we have a public star party Saturday, June 23. At the June meeting Thursday, June 21, we will workout the objects for each member so come ready to commit to being at Long Hunter June 23. If you need help getting oriented and pointed, we will make sure you are ready before the public arrives. Obviously, Mars will be spectacular. We will need small scopes, large scopes, binoculars, and some with no scopes. If you won't be at the meeting June 21 but can come and have fun at the public star party, let me know at a.g.kasselberg@vanderbilt.edu or call Dyer at 373-4897.

A.G. Kasselberg

## 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:

Powell S. Hall, Treasurer  
4343 Lebanon Rd., T-1618  
Hermitage, TN 37076-1223

## 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:

Powell S. Hall, Treasurer  
4343 Lebanon Rd., T-1618  
Hermitage, TN 37076-1223

## HAPPENINGS & EVENTS

June 1- July 15, 2001

6/3 Pentecost  
6/4 Pluto at opp.  
6/5 FULL MOON  
6/6 Conj., Mars and Moon  
6/7 Arietid Meteors  
6/8 Venus at greatest elongation West (46°)  
6/9 Zeta Perseid Meteors  
6/10 Conj., Neptune and Moon  
6/11 Conj., Uranus and Moon  
6/13 LAST QUARTER MOON; Mars at Opposition  
6/14 Dyer Public Night ; Conj., Jupiter and Uranus  
6/16 Private Star Party, Natchez Trace Site; June Lyrid Meteors  
6/17 Conj., Venus and Moon  
6/19 Conj., Saturn and Moon  
6/21 BSAS Monthly Meeting at Dyer 7:30 p.m.; New MOON; Summer Solstice at 2:38 a.m. CDT  
6/23 Longhunter State Park Public Night, Visitor's Center 8:30 to 10:30 pm  
6/27 FIRST QUARTER MOON; June Bootid Meteors  
6/28 Youth Night at Dyer 8:00 -10:00; Beta Taurid Meteors  
6/30 Private Star Party, Natchez Trace Site  
7/3 Conj., Mars and Moon  
7/5 FULL MOON  
7/7 Conj., Neptune and Moon  
7/8 Conj., Uranus and Moon  
7/9 Mercury at greatest Elongation West; Pegasid Meteors  
7/12 Dyer Public Night; Conj., Mercury and Jupiter  
7/13 LAST QUARTER MOON; Private Star Party, Natchez Trace Site  
7/15 Conj., Venus and Saturn

The Eclipse Newsletter  
Editor: Powell S. Hall  
powell.hall@worldnet.att.net

BSAS Officers:  
A.G. Kasselberg, President  
Lonnie Puterbaugh, Vice President  
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Logo Photograph:  
Francisco Diego

## MINUTES OF 17 MAY 2001 BSAS MEETING AT DYER OBSERVATORY

by Bill Hayden

President A.G. Kasselberg opened the meeting at 7:30 P.M. and introduced visitors. He said that a recent public star party had worked well due to assignment of individual viewing objects before the gathering. We expect to assign again at our June meeting for the event at Long Hunter S.P. June 23. BSAS members are needed to help with Youth Night at Dyer May 24; Rocky Alvey and Dr. Hall will be away at the IAPPP symposium.

Nancy Stetten of the State Education Dept. lamented the lack of interest as well as expertise in most scientific pursuits in local public schools. She suggested that our club could develop materials to be given to teachers and hold more public programs. Some members expressed interest and the matter was relegated to future consideration.

Mike Benson announced there had been no astronomy related project at this year's Middle Tennessee School Science Fair, and thus no award given by BSAS. The evening's program consisted of Dr. Douglas Hall presenting a history of the study of variable stars and star spots. In 1596 Fabricius observed Mira (o Ceti) as variable with a 300-plus day period. The star spot theory gained support but was then largely dismissed from about 1906 to 1950. More recently, Dr. Hall was instrumental in showing its validity. As of now, there are no generally accepted theories to explain the spot cycles for our star, or the presence of much larger spots on others.

Meeting adjourned at 9:05.

### For Sale

**CELESTAR 8** in excellent condition with Slow Motion Hand Controller  
Telescope Cover - Padded Carrying Case  
Tripod Carrying Case - Piggyback Camera Attachment  
Dew Shield - 1 1/4 " Star Diagonal - 45 Degree Erect Image Star Diagonal  
6x30 Finder Scope - 8x50 Finder Scope  
f/6.3 Reducer/Corrector - TeleExtender  
T-Adapter with Illuminated Reticle Guide Eyepiece  
Extra Batteries - 8" Solar Filter - Optics Cleaning Kit  
Roll Up Portable Table - Adjustable Stool  
2x Barlow - 25mm Celestron Eyepiece - 35mm Ultima Eyepiece  
6mm Vixen LV Eyepiece - 10mm Vixen LV Eyepiece  
15mm Vixen LV Eyepiece - 25mm Vixen LV Eyepiece  
Moon Filter - Green #58 Filter - Red #25 Filter - Blue #80A Filter  
Yellow #15 Filter - Eyepiece Carrying Case

I am asking \$1200 which I feel is a fair price considering all of the accessories that are included.

Brett Bias [bbias84612@home.com](mailto:bbias84612@home.com)

phone 367-2665 also posted at [www.bsasnashville.com](http://www.bsasnashville.com)

## June 2 through August 12, 2001

M -F 11:30 In Search of New Worlds  
1:00 Explorers of Mauna Kea  
2:30 In Search of New Worlds  
3:30 Explorers of Mauna Kea

Sat 11:30 In Search of New Worlds  
1:00 Skies Over Nashville  
2:30 In Search of New Worlds  
3:30 Explorers of Mauna Kea

Sun 1:30 In Search of New Worlds  
3:30 Explorers of Mauna Kea

**In Search of New Worlds** In recent years astronomers have announced that they have evidence of planets orbiting distant stars. After briefly reviewing our own solar system, find out how those discoveries are made and what such planets might be like.

**Skies Over Nashville** Find out what you can see from your own backyard during this live program that features the constellations, planets, and other celestial events in the current night sky.

**Explorers of Mauna Kea** Mauna Kea, a snowcapped peak rising above the clouds on the big island of Hawai'i, has unique qualities that have become vital to astronomical explorers. This high, dry place with its dark, tropical sky, equipped with the most advanced telescopes ever constructed, continues our journey of exploration to the very edge of the universe.

### Summer Star Parties

Saturday, 23 June 2001  
Longhunter State Park Visitor's Center  
8:30 to 10:30 pm

Saturday, 11 August 2001  
Edwin Warner Park model airplane field  
8:00 to 11:00 pm

Call AstroLine at 615-401-5092 for details and updates.

### JUNE MEETING LOCATION

*The June meeting will be held at Dyer Observatory*

## Happy Birthday Johann Gottfried Galle

by Robin Byrne

This month we look at the achievements of an astronomer mostly known for seeing an object for the first time. Johann Gottfried Galle was born June 9, 1812 in Pabsthaus, Germany. His father worked at a tar furnace. Galle attended elementary and secondary school in Wittenberg, Germany. He went to college in Berlin, where he studied mathematics, science and geography from 1830 to 1833.

The first job Galle got was as a teacher, which he did for two years. Then, in 1835, he was appointed to the staff of the Berlin Observatory as an assistant director under J. F. Encke. Galle held this position until 1851.

Under Encke's supervision, Galle studied the rings of Saturn. In 1837, Encke had discovered a 325 km wide gap in Saturn's A-ring, which is now known as the Encke division. The following year, with the help of the rings being almost face-on, Galle discovered the dark, inner C-ring. Galle also studied comets, and during a three month span in 1839 and 1840, discovered three new comets.

During the 1840's, it was realized that the motions of the planet Uranus did not follow the laws of gravity based upon the known planets. This led to the idea that there may be a planet beyond the orbit of Uranus that is causing this discrepancy. John Couch Adams and Urbain Leverrier, independent of one another, made predictions for the location of a "Trans-Uranian" planet. On September 18, 1846, Urbain Leverrier sent his predictions of this planet's position to Galle. Why to Galle? Because Galle had recently sent to Leverrier a copy of his thesis, and Leverrier wanted to return the honor. The letter arrived on Encke's 55th birthday, September 23. Encke suggested that Galle should take his astronomy student, Heinrich Louis d' Arrest, and go look for this planet. That evening, after an hour of observing, Neptune was discovered less than one degree from Leverrier's predicted position. The 24.4 cm Fraunhofer refractor used for the discovery is still located at the Berlin Observatory and is now known as the Galle refractor.

In 1851, Galle became a professor of astronomy at Breslau (now Wroclaw, Poland) and was also made director of the Breslau Observatory. He remained there until 1897. While at Breslau, Galle developed a method for determining the absolute size of the solar system by observing the parallax of asteroids. At this time, the relative distances within the solar system were known (in terms of Astronomical Units), but the size of an Astronomical Unit was not known. Galle tried his technique with the asteroid Flora in 1873, but was not successful. Other astronomers applied this technique successfully many years after Galle's death. Johann Gottfried Galle died July 10, 1910 in Potsdam.

Johann Galle is one of the unsung heroes of astronomy. His name is usually a footnote in the story of the discovery of Neptune, with not much said about his life or contributions. However, if it were not for people like Galle, many new discoveries would never occur. Certainly Neptune would have eventually been found, but who knows if it would have been as quick if it had not been for Galle's contribution.

### References:

1. Galle, Johann Gottfried. The Columbia Encyclopedia, Sixth Edition. 2001 Web Page <http://www.bartleby.com/65/ga/Galle-Jo.html>
2. Lutherstadt Wittenberg, Johann Gottfried Galle Web Page <http://www.wittenberg.de/seiten/personen/galle.html>
3. Johann Galle Web Page <http://userwww.sfsu.edu/~rsauzier/Galle.html>
4. Johann Gottfried Galle Web Page <http://utenti.tripod.it/freza/page33.html>
5. Britannica.com Web Page <http://www.britannica.com/eb/article?eu=36572>
6. Galle, Johann Gottfried Web Page <http://b.cartage.org.lb/web/bio/bio/G/Galle/1.html>
7. Fauth Web Page <http://home.t-online.de/home/m.holl/galle.htm>
8. Johann Franz Encke Web Page <http://me.in-berlin.de/~jd/himmel/astro/Encke-e.html>

## HOT FLASHES

by Gerald Lappin

Way back when, Galileo thought he saw two Saturnian moons, one on either side of the planet. (He never believed they were handles for he was quite familiar with handles on the mugs of his favorite beverage.) Some year later he took another look and found the moons were gone. I great surprise he exclaimed, in Latin of course, "Saturn has devoured his children!) We now know that the moons were a fuzzy image of Saturn's ring system seen broad on but, later, when the rings were edge on, his telescope could no longer detect them. Pretty silly, you many say, to believe a planet could eat its moons but actually Galileo was the first to express what now seems to be a basic rule of the universe, CANNIBALISM!. In all probability, the planet will swallow up the rings eventually. Also, astronomers have know for some time that large galaxies, including our own Milky Way, feast on smaller galaxies. More recently it has been proposed that in the far distant future the Milky Way will satisfy the sweet tooth of the Andromeda Galaxy. But that's not where all this cosmic gluttony stops. Black holes at the center of the galaxy swallow stars by the millions. More recently it was reported that a star in Hydra, a star much like our Sun, appears to have ingested one or more of its planets. Another recent report suggests that black holes set space around them into a spinning whirlpool.. We all know what happens to stuff that orbits close to a black hole. It is swallowed up, never to be regurgitated. Is the final fate of the universe to have all of space and everything occupying space disappear down the maw of a giant black hole? Will it all be spewed out elsewhere and elsewhen to start the whole cycle of creation and digestion all over again? Or have I been out in the sun too long?

### May 2001 Editorial

#### A Favorable Opposition of Mars

##### I

Because a hen's egg is not perfectly round, certain points on its shell are nearer to the yolk within than other points. Just so, because the orbit of the planet Mars is an ellipse rather than a circle, certain points on the Martian orbit are closer to the Earth's orbit within it than other points. When Mars at one of these points is passed by earth, we have what is called a favorable opposition. Such an opposition takes place this month.

In fact, it was through calculations of the position of Mars that the astronomer Johann Kepler around the year 1600 discovered that Mars' orbit was not a circle, as everyone had thought, but an ellipse. Kepler's stubborn honesty and mathematical skill joined with the exact observations of Mars which he had inherited from Tycho Brahe led to this breakthrough discovery. The great Copernicus lived and died thinking planets went in circles. Galileo, Kepler's contemporary, a fellow astronomer who corresponded with Kepler and outlived him many years, never left any indication he realized the elliptical nature of planetary orbits.

Of the nine planets, Mercury and Pluto, the smallest, have the least circular orbits. Mars is next, both in diameter and eccentricity. These three smallest planets move in orbits that are less circular than all the rest, although all planetary orbits, as Kepler taught us, are elliptical.

##### II

This June the brightest object in the evening sky after the moon is the planet Mars. It is brighter than usual because it is closer to us than usual. The red planet will enter the constellation Ophiucus on June 1 and will be in opposition on June 13. That is the date when the faster moving earth will overtake Mars and Mars will be opposite the sun. Like the full moon, a planet in opposition is up all night and highest at midnight, when it will be due south. Mars varies in brightness more than any other planet because its distance from earth varies so widely. Sometimes Mars is as far as 235 million miles from earth; sometimes, only 35 million miles. On June 13 Mars will be 42 million miles. This is considered a favorable opposition. When earth passes Mars in the winter Mars can be as far as 63 million miles away, a distance 50% greater than this June. The earth goes around the sun in 365  $\frac{1}{4}$  days; Mars, in 687 days. So, after passing Mars, when one year has elapsed and the earth has made one revolution, Mars has made only about half a revolution around the sun. A synodic revolution, the period between oppositions, requires more than two years -- 779 days. This is about 26 months. After earth passes Mars in June, 2001, it will pass Mars again in August, 2003, when the planets will be even closer. The most favorable oppositions of Mars occur in late summer every 15 or 17 years.

I recall a favorable opposition of Mars on September 10, 1956, when I was living in Pontiac, Illinois. Star gazers like to find a dark spot with an open view of the sky from which to make their observations. I thought I had found one in Pontiac. The place was very dark; and nothing obstructed the eastern sky in which a bright Mars was rising. In the midst of enjoying this experience, I heard a loud voice that seemed to be coming from a point over my head. The voice said, "Who are you, and what are you doing?" I replied by identifying myself and mentioning my planet watching. The voice had come from a prison guard in a tower, who advised me to take my observing elsewhere if I did not wish to risk being shot! I left.

Antares, the red-giant star whose name means "Rival of Mars," is found in the constellation Scorpius and is seen in the south each summer. This summer they are fairly close to each other in the sky. Antares rises first; then, shortly after, Mars. The star and the planet are always very similar in color. In brightness, however, they are practically identical to the unaided eye only when the planet is much farther from us than it is this June, when as I said above, Mars will be the brightest starlike object in the evening sky. Look for them both in the southeast: first Antares, then much brighter Mars.

Powell Hall

#### NEW DIRECTIONS TO BSAS DARK-SKY SITE

Go west on Old Hickory Blvd. from I-65, 4.5 miles to Hillsboro Rd. Go south on Hillsboro Rd. for 3.4 miles to Highway 46 and turn right. You will see Grassland Elementary school on the left as a landmark.

.. Follow Highway 46 for 5.8 miles to Highway 96 and a flashing red light.

.. Continue straight on Highway 46 for 6.0 miles through Leiper's Fork to a right turn just outside of town, to stay on route 46.

.. Continue on Route 46 for 0.9 miles to Natchez Trace Parkway.

.. Follow the entrance ramp to the Parkway and turn right, toward Tupelo, Mississippi.

.. Follow the Parkway for 17.2 miles, passing Old Trace and Burns Branch, to the "Water Valley" overlook. Our site is the parking area.

(THIS NEW SITE IS 12 MILES FARTHER SOUTH PAST THE OLD SITE WHICH WAS AT MILE MARKER #424)