



# ECLIPSE



*The Newsletter of the Barnard-Seyfert Astronomical Society*

July 2001

Occasionally an event or project comes along that is so exciting you just have to get involved. Here at Dyer Observatory, we recently learned of one such project, which the Astronomical League is marshaling, the ISS-AT. What is it you ask? Well, here is a description from the Website.-

### What is the ISS-AT?

The ISS-AT is an astronomical telescope mounted on the International Space Station, and operated by amateur astronomers for the education and benefit of the world's citizens.

The telescope will be delivered to the Space Station on an ISS Express Pallet and mounted on the ISS truss. The telescope optics will consist of a Cassegrain telescope with an aperture between 350 and 400 millimeters, and a focal length commensurate with diffraction-limited imaging of celestial objects. An array of CCD detectors will capture images for transmission to Earth.

The Astronomical League, a consortium of US amateur astronomy clubs headquartered in Kansas city, MO, is responsible for all ISS-AT operations. Working in close coordination with established astronomical societies around the world, the League will host a working group responsible for the scheduling, operation, and distribution of ISS-AT observations.

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### HAPPENINGS & EVENTS

July 1- August 15, 2001

- 7/3 Conj., Mars and Moon
- 7/4 INDEPENDENCE DAY
- 7/5 FULL MOON, Partial Lunar Eclipse
- 7/7 Conj., Neptune and Moon
- 7/8 Conj., Uranus and Moon; Mercury, gr. elongation W.
- 7/12 Dyer Observatory Public Night; Conj. Mercury & Jupiter
- 7/13 Conj., Saturn and Aldebaran; LAST QUARTER MOON
- 7/14 Private Star Party, Natchez Trace Site
- 7/15 Conj., Venus & Aldebaran; Conj., Venus & Saturn
- 7/17 Conj., Saturn and Moon, Occultation; Conj., Venus and Moon, Occultation
- 7/19 BSAS Meeting at Dyer, 7:30 p.m., Speaker Dr. Rick Chappell " Training for a Space Shuttle Mission" ; Conj., Jupiter and Moon, Occultation; Conj., Mercury & Moon Occultation
- 7/20 NEW MOON
- 7/21 Private Star Party, Natchez Trace Site
- 7/26 Youth Night at Dyer 8:00 -10:00
- 7/27FIRST QUARTER MOON
- 7/28 Aquarid Meteor Peak
- 7/30 Neptune at Opp.; Conj., Mars & Moon
- 8/3 Conj., Neptune & Moon
- 8/4 FULL MOON
- 8/5 Conj., Uranus & Moon; Mercury Superior Conj.
- 8/6 Conj., Venus & Jupiter
- 8/9 Dyer Observatory Public Night
- 8/12 LAST QUARTER MOON, Perseid Meteors Peak
- 8/14 Conj., Saturn & Moon, Occultation
- 8/15 Uranus at Opp.; Conj. Moon and Jupiter and Venus
- 8/16 BSAS Meeting at Dyer Observatory 7:30 p.m., Topic "Making Telescopes"; Conj. Venus & 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:

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  
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The Eclipse Newsletter

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Logo Photograph:

Francisco Diego

MINUTES OF BSAS MEETING OF 21 JUNE 2001  
AT DYER OBSERVATORY

by Bill Hayden

President A.G. Kasselberg called the meeting to order at 7:30 P.M. Visitors were introduced, some being attendees of the Photometry School in session.

In Powell Hall's absence, A.G. gave a verbal Treasurer's report and noted a total balance of approximately \$3650.

Key holders for each day of the week have been designated for club use of the C-14 telescope. Beginning with Monday, they are Mike Benson, Lonnie Puterbaugh, A.G. Kasselberg, Lloyd Watkins, Curt Porter, Jim Reed and Tom Murdic. Dudley Pitts will substitute. The scope is usable, though several adjustments are in order. It was noted that advance notice to the key holder for a given night would be desirable, though tenuous due to weather.

Objects were assigned for Saturday's public starparty at Long Hunter State Park. Members were encouraged to verbally describe viewing objects, and bring any available pictures of them.

Astronomical League coordinator Mike Benson moved the club continue its A.L. membership, which involves a \$10. yearly club fee plus \$3.50 per member. The motion was unanimously passed. Current addresses of BSAS members are needed for receipt of the A.L. newsletter, "Reflector". BSAS voted to support Mike's voting choices for A.L. officers.

Professor C. Robert O'Dell of Vanderbilt's Physics and Astronomy Dept. presented the evening's program on the Orion nebula. He showed slides from the Hubble Space Telescope and the Very Large Array, and put forth facts and theories concerning the origin and current activity of the nebula's components.

Meeting adjourned 9:03 P.M.

*ISS-AT continued from page 1*

The ISS-AT observing program will consist of a broad-based "background program" of synoptic planetary observations and selected deep-sky objects, and a "foreground program" of observations proposed and requested by individual amateur astronomers, groups of amateur astronomers, and established astronomical associations.

Program selection is the responsibility of the League; selection criteria will strongly favor observations that cannot be made from Earth's surface, and observing programs must be consistent with the broad goals and aims of amateur astronomy. All observations will be placed on an ISS-AT Internet site within 24 hours of receipt, and all data will be placed in the public domain.

*If you would like more information about this history making project, please visit - [www.issat.org](http://www.issat.org)*

**July 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, 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.

*JULY MEETING LOCATION*

*The July meeting will be held at Dyer Observatory*

## Happy Birthday Crab Nebula

by Robin Byrne

This month we celebrate some fireworks of a different sort. On July 4, 1054, people around the world witnessed the appearance of a new star in the constellation of Taurus.

The most reliable record of this event comes from the Chinese, who systematically recorded unusual events in the sky (such as "guest stars", comets and meteor showers) between 532 BC and 1064 AD. In this case, five independent sources had recorded the "guest star" in Taurus. In 1928, Edwin Hubble had noticed that based upon the measured expansion rate of the Crab Nebula, it should have begun about 900 years earlier. It was Hubble who connected the current Crab Nebula with the event recorded by the Chinese astronomers. Japanese sources also recorded that sometime between June 28 and July 7, 1054 "a guest star appeared within the same longitude as ... Orion. Seen in the eastern heavens ... a star as large as Jupiter." We now know that this "guest star" was the final, dramatic stage in a massive star's life as it tears itself apart in a supernova explosion.

Others who might have witnessed this spectacle were the Anasazi Indians in the American southwest. Preserved drawings from these peoples found in Navaho Canyon (AZ), White Mesa (AZ), and Chaco Canyon (NM) all show a large star near a crescent moon. This corresponds to what would have been seen on the morning of July 5, when the crescent moon was very close to the location of the supernova as seen from the American southwest. A similar motif was found in the artwork on a pottery plate made by the Mimbres Indians from New Mexico that dates from between 1050 and 1070 AD, putting it at the same time as the explosion.

It could not have been easy to miss. At its brightest, estimates put this supernova at a magnitude between -6 and -12 and was visible during daylight for 23 days, and had naked eye visibility at night for at least 653 days.

Despite so many recorded observations from the Far East and American southwest, there is a dearth of observations from anywhere else. If it was so bright, why aren't there records from other places around the world? There may, however, be some oblique references to it. In an excerpt from an Arab medical book detailing the outbreak of an epidemic, a physician reported that the outbreak began shortly after a "spectacular star appeared in Gemini in the year 446H", which would correspond to sometime between April 12, 1054 and April 1, 1055. Two Italian records concerning the death of Pope Leo IX, which occurred in April of 1054, have references to "... an orb of extraordinary brilliance..." And, referring to the reforms made by Pope Leo IX, "...a new light was seen to dawn upon the world." Although the Pope's death was 3 months earlier than the supernova, there may have been some historical license taken to try to tie the two events together and build up the image of the controversial Pope. This is also seen in the quote, "...the Lord perhaps showing thereby that he [Leo] had been found worthy to receive the crown [of righteousness] in Heaven, among those who love Him." Especially in a time where the heavens were thought to be unchanging, a good explanation for a new star had to be found that would not contradict religious doctrine.

Whoever may have observed the explosion, observations of this object didn't end with the fading from view of the supernova. Besides optical observations of the beautiful supernova remnant (now designated as M1), it was first observed with a radio telescope in 1948 and was found to be a strong radio source. In 1964, x-rays were detected from the supernova remnant, as well. However, one of the most important discoveries occurred in 1968, when Jocelyn Bell discovered that the radio source varied at a regular rate, or "pulsed." This "pulsar" became the first proof that the result of a supernova explosion is a highly dense object known as a neutron star.

While you are out enjoying the fireworks display on the Fourth of July this year, you may want to try to imagine what that spectacular display of 1054 must have been like. We haven't had a visible supernova in our own galaxy since the time of Tycho Brahe and Johannes Kepler in the 16th century. We are overdue for a light show. Maybe on July 4th....

### References:

Supernova 1054 - Creation of the Crab nebula Web Page

[http://www.seds.org/messier/more/m001\\_sn.html](http://www.seds.org/messier/more/m001_sn.html)

Crab Supernova Appears Web Page

<http://www.stellar.co.nz/tl14.html>

Home Page for Dr. Daniel P. McCarthy

<http://www.cs.tcd.ie/Dan.McCarthy/>

**Deadline for articles and news items for August ECLIPSE: 26 July one week after the monthly B.S.A.S. meeting**

## EDITORIAL

A review of  
Parallax: The Race to Measure the Cosmos by Alan W. Hirshfield

Ancient astronomy was primarily concerned with what we know as the solar system. The stars, called "The fixed stars," formed the background for the seven bright wanderers - Sun, Moon, Saturn, Jupiter, Mars, Venus, and Mercury. And the cosmos was believed to consist of spheres for each of these wanderers. Above the spheres of the highest planet Saturn was the sphere of the fixed stars. At the center was the Earth. Only one Greek astronomer, Aristarchus of Samos, thought that the sun rather than the Earth was the center. I recall reading in Ptolemy's Almagest that if the earth moved, then there would be a shift in position as the sky was seen from one side of Earth's orbit and six months later from the other side. No such shift was observed; therefore, Aristarchus was mistaken and the immobile earth was the center of the cosmos.

The apparent shift in position of objects seen from different points is called parallax. Centuries after Ptolemy, when Copernicus' heliocentric cosmology began to challenge and ultimately to displace the Ptolemaic geocentric cosmology, the issue of parallax challenged astronomers anew. Hirshfield's book is the thoroughly researched and readably written account of how they sought and finally achieved the determination of stellar parallax.

The daunting difficulty of the enterprise lies in the astonishingly great distance from us of even the nearest stars. No unaided eye measurements can detect such tiny apparent shifts. And telescopes were not sufficiently precise to do so either, for more than two centuries after Galileo first looked through his tube and lenses at the heavens. Proving the Copernican thesis of a moving earth was the principal early motivation for finding parallax. In the 1720's Englishman James Bradley had the serendipity to discover the aberration of starlight. He observed a star overhead in the constellation Draco with his scope aimed straight up a chimney. The star appeared to shift its position because the earth was moving. This afforded the first physical proof of heliocentric cosmology. But stellar parallax is smaller than aberration. So Bradley was unsuccessful getting parallax. In the same 18th century, much later, and in the same England, William Herschel tried to find parallax using a method suggested by Galileo. This was to assume that when a bright star appeared close to a faint star, the bright star was much closer. Herschel did not detect parallax but did, contrary to his own assumption, discover the prevalence of binary stars, i.e. stars which not only look but are close to one another. Two significant milestones of astronomy stumbled upon by great observers seeking parallax.

As the nineteenth century began, the race for parallax was on. Many claims were made and judged "not proven" by the astronomical community. Thus Thomas Henderson, whose record of Alpha Centauri were made with a flawed telescope, kept back publication until more observations were available. Meanwhile, three outstanding men, Bessel, Fraunhofer, and Struve realized the measurement of parallax with indisputable data. Bessel found the parallax of 61 Cygni; Struve, that of Vega; and Fraunhofer provided telescopes for both, telescopes surpassing any previously made.

This hastily written review is far less readable and chockfull of human interest and excitement than Hirshfeld's book, which I heartily commend to you, whether you are a beginner or an old hand at astronomy. In an epilog the author brings the history of parallax up to date and beyond, briefly telling how photography first and most recently space-based observing have extended both the numbers of stars whose parallax has been or will be found and the distances for which actual parallaxes are possible.

I hope to give you excerpts from Parallax and a few tiny errors in a later editorial. Read this book!

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)