

## Smoky Mountain Astronomical Society

S. C. R. A. P. S.

Volume 31, Number 4  
April, 2008



### Society's Chronological Astronomical Papers

Midnight.....

There's no sound in the forest –  
only the phantom murmur  
of the far wind  
and the wind's shadow drifting  
as smoke  
through ebon branches; there a single star  
glistens in the heart of night....

A star!

Look, skyward now...  
and see above...INFINITY  
Vast and dark and deep  
and endless....your heritage:  
Silent clouds of stars,  
Other worlds uncountable and other suns  
beyond numbering  
and realms of fire-mist and star-cities  
as grains of sand....  
drifting...

Across the void....

Across the gulf of night....

Across the endless rain of years....

Across the ages.

Listen!

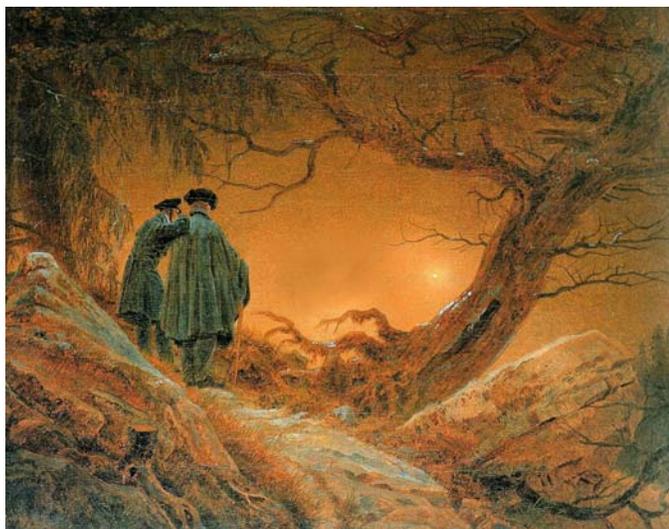
Were you the star-born you should hear  
That silent music of which the ancient sages spoke

Though in silent words...

Here then is our quest

and our world

and our home.



*Robert Burnham Jr would have been 77 this coming June 16. His magnificent "Burnham's Celestial Handbook" still stands as one of mankind's greatest testimonies to the allure and mystery of astronomy. Uncredited, he is probably the author of his book's Frontispiece, excerpted above. His love of the stars is palpable and inspiring.*

*Our SMAS library has two complete sets of this wonderful work (each set has three volumes). Volume One begins with a compact but enlightening explanation of almost every astronomic concept, an education in 101 pages. The remaining pages and volumes deal in detail with each of the 88 constellations describing individual stars, multiple stars, nebulas, clusters, galaxies and special features.*

The meeting was called to order by President Scott Beyers at 7:30pm. In attendance were 25 SMAS members and one guest. Club business discussed at the meeting:

- planning a weekend camping/observing trip to Bandy Creek Campground in the Big South Fork Wilderness
- the possibility of moving some of the Look Rock Star Parties to the Townsend, TN Visitors Center
- bringing awareness of dark skies to the area
- purchasing/upgrading some of the clubs eyepieces was brought up and after some discussion a couple of members are going to research our options and discuss them with the club

In addition we had a short discussion on the personal Astronomy related interests and experiences of the members. Some of the topics included a viewing session at Look Rock by a couple of members, the viewing of a NASA rocket venting fuel, and the purchase of one member of a pair of Big Binoculars.

The program for the evening was on Global Rent a Scope (GRAS), presented by Mike Littleton. GRAS is a network of online telescopes where individuals can purchase imaging time on the telescopes strategically located around the globe to provide dark skies and good weather 24 hours a day. Through online tutorials and experience members use high quality equipment to pursue their interests. For those interested in what GRAS has to offer you can visit their web page at

[www.global-rent-a-scope.com](http://www.global-rent-a-scope.com)



## Early Bird Gets the Worm or “Black Hole Breakfast”

by Dr. Tony Phillips

We all know that birds eat worms. Every day, millions of birds eat millions of worms. It's going on all around you! But how often have you awakened in the morning, stalked out in the dewy grass, and actually seen a bird having breakfast? Even though we know it happens all the time, a bird gulping a worm is a rare sight.

Just like a black hole gulping a star...

Every day in the Universe, millions of stars fall into millions of black holes. And that's bad news for the stars. Black holes exert terrible tides, and stars that come too close are literally ripped apart as they fall into the gullet of the monster. A long burp of X-rays and ultraviolet radiation signals the meal for all to see.

Yet astronomers rarely catch a black hole in the act. “It's like the problem of the bird and the worm,” says astronomer Christopher Martin of Caltech. “You have to be in the right place at the right time, looking in the right direction *and* paying attention.”

A great place to look is deep in the cores of galaxies. Most galaxies have massive black holes sitting in their pinwheel centers, with dense swarms of stars all around. An occasional meal is inevitable.

A group of astronomers led by Suvi Gezari of Caltech recently surveyed more than 10,000 galactic cores—and they caught one! In a distant, unnamed elliptical galaxy, a star fell into a central black hole and “burped” a blast of ultraviolet radiation.

“We detected the blast using the Galaxy Evolution Explorer (GALEX), an ultraviolet space telescope,” explains Gezari. Her team reported the observation in the December 2006 issue of *The Astrophysical Journal Letters*. “Other telescopes have seen black holes devouring stars before,” she adds, “but this is the first time we have been able to watch the process from beginning to end.”

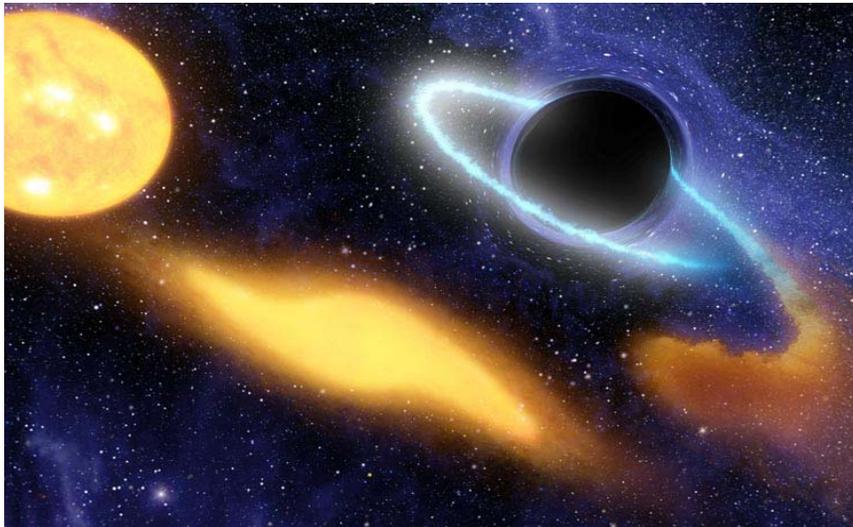
The meal began about two years ago. After the initial blast, radiation diminished as the black hole slowly consumed the star. GALEX has monitored the process throughout. Additional data from the Chandra X-ray Observatory, the Canada-France-Hawaii Telescope and the Keck Telescope in Hawaii helped Gezari's team chronicle the event in multiple wavelengths

Studying the process in its entirety “helps us understand how black holes feed and grow in their host galaxies,” notes Martin.

One down, millions to go.

"Now that we know we can observe these events with ultraviolet light," says Gezari, "we've got a new tool for finding more."

For more on this and other findings of GALEX, see [www.galex.caltech.edu](http://www.galex.caltech.edu). For help explaining black holes to kids, visit The Space Place at [spaceplace.nasa.gov](http://spaceplace.nasa.gov).



This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



## Tracking Wildlife from Space

by Patrick Barry

It's 10 o'clock, and do you know where your Oriental Honey Buzzard is?

Tracking the whereabouts of birds and other migrating wildlife across thousands of miles of land, air, and sea is no easy feat. Yet to protect the habitats of endangered species, scientists need to know where these roving animals go during their seasonal travels.

Rather than chasing these animals around the globe, a growing number of scientists are leveraging the bird's-eye view of orbiting satellites to easily monitor animals' movements anywhere in the world.

The system piggybacks on weather satellites called Polar Operational Environmental Satellites, which are operated by the National Oceanic and Atmospheric Administration (NOAA), as well as a European satellite called MetOp. Sensors aboard these satellites pick up signals beamed from portable transmitters on the Earth's surface, 850 kilometers below. NOAA began the project—called Argos—in cooperation with NASA and the French space agency (CNES) in 1974. At that time, scientists placed these transmitters primarily on buoys and balloons to study the oceans and atmosphere. As electronics shrank and new satellites' sensors became more sensitive, the transmitters became small and light enough by the 1990s that scientists could mount them safely on animals. Yes, even on birds like the Oriental Honey Buzzard.

“Scientists just never had the capability of doing this before,” says Christopher O'Connors, Program Manager for Argos at NOAA.

*The ARGOS program tracks the whereabouts of endangered migrating animals via miniature transmitters on the animals and the POES satellites in orbit.*



Today, transmitters weigh as little as 1/20th of a pound and require a fraction of a watt of power. The satellites can detect these feeble signals in part because the transmitters broadcast at frequencies between 401 and 403 MHz, a part of the spectrum reserved for environmental uses. That way there's very little interference from other sources of radio noise.

“Argos is being used more and more for animal tracking,” O’Connors says. More than 17,000 transmitters are currently being tracked by Argos, and almost 4,000 of them are on wildlife. “The animal research has been the most interesting area in terms of innovative science.”

For example, researchers in Japan used Argos to track endangered Grey-faced Buzzards and Oriental Honey Buzzards for thousands of kilometers along the birds' migrations through Japan and Southeast Asia. Scientists have also mapped the movements of loggerhead sea turtles off the west coast of Africa. Other studies have documented migrations of wood storks, Malaysian elephants, porcupine caribou, right whales, and walruses, to name a few.

Argos data is available online at [www.argos-system.org](http://www.argos-system.org), so every evening, scientists can check the whereabouts of all their herds, schools, and flocks. Kids can learn about some of these endangered species and play a memory game with them at [spaceplace.nasa.gov/en/kids/poes\\_tracking](http://spaceplace.nasa.gov/en/kids/poes_tracking).

*This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.*



# April 2008

| SUN                                | MON            | TUE | WED | THU   | FRI   | SAT  |
|------------------------------------|----------------|-----|-----|---|---|--|
| SCRAPS depends<br>Upon its friends | Help!<br>Help! | 1   | 2   | 3   | 4 TSSP<br>Fall Creek<br>Falls SP<br><br>UTK | 5 New<br>Moon<br><br>Star Party<br>UC<br><br>TAO |
| 6                                  | 7              | 8   | 9   | 10  | 11<br>Meeting<br>PSTCC<br>7 pm              | 12<br>Star Party<br>LR                           |
| 13                                 | 14             | 15  | 16  | 17  | 18<br><br>UTK                               | 19<br><br>TAO                                    |
| 20                                 | 21             | 22  | 23  | 24  | 25  | 26   |
| 27                                 | 28             | 29  | 30  | UTK—roof of Neilson Physics Building<br>on The Hill at UT<br>1st & 3rd Fridays<br>TAO—Tamke-Allan Observatory<br>Public Stargaze<br>Watts Bar Lake, Roane County<br>1st & 3rd Saturdays |   |  |