

# The Focal Point

The Atlanta Astronomy Club  
Established 1947  
November 2006

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Editor: Kat Sarbell

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## November General Meeting

By Keith "Kosmic Kow" Burns, AAC Program Chair

The next general meeting of the Atlanta Astronomy Club will be on November 17th at 8 P.M. at Emory University at the Goodrich Whitehall building. The meeting will take place in room 207. This is the first room on the left after entering into the building through the double doors. We will have refreshments just outside of the room before the meeting. A small donation in the "kitty" box is requested but not required. Directions to White Hall are on page 7.

The meeting starts at 8 PM sharp. We will have our business meeting first. This includes any announcements and other things of astronomical interest. Anyone who wishes to make any announcements, please notify Peter Macumber via email at ([president@atlantaastronomy.org](mailto:president@atlantaastronomy.org)) and also email Me (Keith Burns) via email at [Keith\\_B@Bellsouth.net](mailto:Keith_B@Bellsouth.net). That way Peter knows who is speaking ahead of time and he can schedule the time. I need to know so I can put your information on a power point presentation slide that will run before and during the beginning of the business meeting. Please have the announcement stuff to me by no later than November 14th, 2006 (Tuesday).

Our featured speaker of the night, Ron Buta gives his talk with questions and answers to follow. We adjourned the meeting and head off to a local eating establishment for supper, dessert, and/or just a drink.

His talk is titled, "Galaxy Classification in the 21st Century: The Story behind the de Vaucouleurs Atlas of Galaxies."

Galaxy classification has been a staple of extragalactic research for many decades. Often when astronomers choose samples of galaxies to study in detail, they select on the basis of morphological type using classifications listed in various published galaxy catalogues. These classifications are inevitably related to the system published by Edwin Hubble in 1926, and elaborated upon years later by Allan Sandage and Gerard de Vaucouleurs. In 1961, Allan Sandage published a galaxy atlas outlining Hubble's views



on galaxy morphology, later adding his own views in the Carnegie Atlas of Galaxies (1994). The de Vaucouleurs Atlas of Galaxies is the equivalent of the Carnegie Atlas but outlines galaxy classification in the revised Hubble system published by de Vaucouleurs in 1959, with a few modifications proposed by others. The de Vaucouleurs Atlas is being published by Cambridge University Press and is set to be available in early 2007.

It is the first major galaxy atlas where all the illustrations are based on digital images.

In my presentation, I will describe the story behind the de Vaucouleurs Atlas, how it got started, why classical galaxy morphological classification is still of scientific value even today, the difficulties in preparing the digital images used for the illustrations, and how the book integrates classical morphology with our modern understanding of galaxies.

Here is my background: I received my PhD in Astronomy from the University of Texas at Austin in 1984. My PhD dissertation was titled "The Structure and Dynamics of Ringed Galaxies," and was prepared under the supervision of Gerard de Vaucouleurs. While at UT Austin, de Vaucouleurs sent me out on many observing runs at McDonald Observatory to do photoelectric galaxy photometry, a technique that actually, at the time (1977-1984), utilized my skills as a visual observer. Although I do not do such photometry any more, I haven't lost my basic curiosity of the sky and have attended the PSSG for at least the past five years.

Most of my recent research has centered around the quantification of bar strength in galaxies using a gravitational torque indicator. I have also been active in amateur paleontology in Alabama and recently co-edited a monograph on coal age vertebrate and invertebrate track ways found at a discontinued surface mine near Jasper.

<http://bama.ua.edu/~rbuta/devatlas/> - The Galaxy Morphology Website based on the de Vaucouleurs Atlas (still in development).

<http://bama.ua.edu/~rbuta/nirs0s/nirs0s.html> - my near-IR project on early-type galaxy bars (still under development).

<http://kudzu.astr.ua.edu/drawings/nebulae/nebulae2.html> - for some old visual observations I made years ago at McDonald and Siding Spring Observatories.

## Upcoming Speakers and Program

December 2006 there will be a Christmas dinner again this year. This is a popular event. So the speaker chairman will not disappoint the masses. The date is Friday December 8th, 2006. Time 7 PM for general gathering and eating at 7:30 PM. Location is the Atrium of the Math and Sciences Building across the street from our usual meeting spot of Whitehall. Please contact Sharon Carruthers for information on what to bring food wise with and other general info in regards to that. She can be reached at [treasurer@atlantaastronomy.org](mailto:treasurer@atlantaastronomy.org). The club will provide the meats, cups, plates, and utilizes. We need you to bring the rest. We are looking for side dishes, desserts, and healthy stuff. Alex Langoussis and Dave Riddle both have been to Africa. Their program will be about that trip. It's going to be an interesting program that will complement the dinner. Thanks to Rick Williamson for making this happen. More to come next month.

## Charlie Elliott October Minutes

by Clevis Jones, CEC Recording Secretary

Charlie Elliott Chapter (CEC) Meeting Minutes: October 14, 2006

HEADS-UP: Wednesday afternoon, NOVEMBER 8, 2006: Weather permitting, we'll meet about 1 p.m. on the CE observing field for the transit of Mercury. 1st contact is at 2:12 p.m. EST. This is the last Mercury transit we'll have the opportunity to see for about 10 years.

Special Note: Many thanks to Lee Nelson and Jon Wood for mowing the CE observing field !!!

ATTENDANCE: Fifteen guests and members attended the October CE chapter meeting.

BUSINESS: Larry Owens briefly covered the clubs equipment and the "Telescope Baby-sitting Program", including who has what. He also talked about next month's SHORT meeting in that there are three events happening, 1. a visit to Deer Lick Astronomy Village for those interested - note: on the last turn, it is 0.3 miles to the entrance, NOT 3.0 miles [thanks Lee], 2. Dale Harrison will bring some students from the George Walton Academy in Monroe to the meeting with possible observing afterwards (VOLUNTEERS?), 3. Camp Twin Lakes (a camp near Rutledge, GA for children with special needs) asked us to give an observing session there between 10:30 p.m. and 11:30 p.m. the night of our meeting, November 11 (VOLUNTEERS?) - More on these as the time draws near - for the latest breaking news or questions, tune in to the: CE Yahoo-group message board: [http://groups.yahoo.com/group/charlie\\_elliott\\_chapter/](http://groups.yahoo.com/group/charlie_elliott_chapter/) or the CE Web-site: <http://www.ceastronomy.org/> VOLUNTEERS, please contact Larry Owens at: [Director@CEastronomy.org](mailto:Director@CEastronomy.org)

2006 remaining schedule - November 11 (3rd Qtr.) & shift to 3 p.m. for the winter schedule, December 9 (Wn Gib).

2007 schedule for the 2007 CEC Meetings is as follows: January 13, February 10, March 10, April 14 (back to 5 p.m. for the summer), May 19 (JAKES DAY - volunteers needed, and ELECTION of Officers), June 9, July 7, Aug 18, September 15, October 6 (note: Peach State on the 13th), November 3 (back to 3 p.m. for the winter), December 15.

CURRENT EVENTS: Clevis Jones not so briefly covered Anousheh Ansari's visit to the ISS, Atlantis and the STS-115 crew's installation of the port solar array on the ISS, Cassini, Smart-1, the partial Lunar eclipse, the upcoming November 8th transit of Mercury, and the IAU's recent decision to rearrange our solar system to 8 planets and, currently, 3 dwarf planets.

FEATURE PRESENTATION: Jim Honeycutt, Instructor of Astronomy at Oxford College in Oxford, GA (just north of Covington) presented two lab sessions: After first explaining some terms, like the H-R diagram of stars and the B-V color index characteristics of stars, the first lab was on determining Jupiter's mass by observing its moons. Everyone had use of a school computer (THANK YOU Oxford College!). You controlled a

virtual telescope, took data on one of Jupiter's moons' cycle via the software program, plugged that into formulas Jim gave out and determined Jupiter's mass! For the second lab, this time using a computer's virtual telescope photometer, you measured the V (visual), and B (blue filter) magnitude of a star. Then you used the data to determine the distance to that star in the Pleiades star cluster. As you work on the labs, Jim swings by every one's position helping to get you over any hurdles you may encounter. Personal note - these labs Jim gives are ABSOLUTLY FASCINATING - a must attend! As I mentioned on the CE Yahoo message board prior to this meeting at Oxford, for these labs at Oxford, we may want to take a vote to forego the What's up Tonight and/or Current Events features to get more lab time. We look forward to more lab work, very soon! THANK YOU, JIM!

OBSERVING SESSION: About 20 folks with telescopes up to 22-inches were on the CE observing field to take a look at comet Swan and other fine objects - a very nice, cool evening of viewing, with everyone sharing information and the views through their telescopes.

## Charlie Elliot Future Meetings

by Clevis Jones, CEC Recording Secretary

MEETING DATES AND PROGRAMS:

NOVEMBER 11, 2006 at 3:00 p.m. - TIME CHANGE TO THE WINTER SCHEDULE.

FEATURE PRESENTATION:

SHADOWS & SILHOUETTES: Chapter director, Larry Owens, will give a NASA Night Sky Network presentation about eclipses, transits, lunar and planetary phases and how scientists are attempting to use transits to detect Earth sized planets around other stars! Everyone is welcome.

Place: Charlie Elliott Visitor's Center

Time permitting after the feature presentation:

What's Up Tonight: by Steve Beiger

Current Events: by Clevis Jones

DECEMBER 9, 3:00 p.m.: TBD

FOR UPDATES & DIRECTIONS: PLEASE check the CEastronomy website for the most current meeting information !

<http://www.CEastronomy.org>

## Bradley Observatory Open House Series 2006-2007

"Astronomy Through Time" - Humans have looked up at the heavens for as long as they have had eyes to see and minds to wonder. The Open House Lecture Series this year concentrates on astronomy through the centuries, the history of astronomy. Explore the impact of changing technology on astronomical understanding, hear inspiring human stories of discovery and exploration and delve into the myths and architecture of ancient cultures.

All talks are free and open to the public. Lectures begin at 8 p.m.; doors open at 7:30 p.m. Bradley Observatory and Delafield Planetarium. Here is the schedule for Fall 2006. The programs for Winter/Spring 2007 will be announced later.

November 10 - Miller Goss, National Radio Astronomy Observatory

December 8 - Christopher De Pree, Associate professor of astronomy and chair, Agnes Scott

The Schedule for Winter/Spring 2007 will be announced later.



## Peach State Star Gaze 2006

Enjoy these pictures taken at the last Peach State Star Gaze, which was held from October 16th through 22nd at Whitewater Express camp in Tennessee. More coverage and photos will be in the December issue of the *Focal Point*. Above: PSSG initials “painted” with a red flashlight by Daniel Herron.



During sunny days, Tom would also set up his scope for solar observing. Photo by Daniel Herron.



During set-up, one area quickly became known as “Dob Hill.” Photo by Tom Faber.



Keith Burns, program chair (left), and Mark Sandburg, light pollution expert, observe the sun with Keith’s Astroscan. Photo by Daniel Herron.



Tom Crowley sets up his Dobsonian. Photo by Daniel Herron.

Right: The NASA van visited the field with exhibits. Here, (from left to right) observing chair Daniel Herron, the NASA representative, and the *Focal Point* editor check out the displays, including a “practice spacesuit” used for astronaut training. Photo by Tom Faber.





Above: Club program chair Keith Burns begins his program on solar observing. Photo by Tom Faber.

Left: Club president Peter Macumber (right) introduces guest speaker Bob Berman of *Astronomy* magazine. Photo by Daniel Herron.



During the star party, the leaves transformed into their autumn colors. Volunteer Tom Faber took this photo from the large field behind the dining hall.

Right: Tom Faber took this photo of the sun through Keith Burns' Astroscan on the last day of the Peach State.



Top Right: Tom Crowley sets up his solar radio scope to "listen" to the sun. Photo by Tom Faber.

Above: A spectacular sunset sets the stage for a great night of observing. Photo by Tom Faber.

Left: The International Space Station streaks past the constellation of Cassiopeia. Photo by Daniel Herron.

# Twin APL-Built, Solar-Studying Spacecraft Successfully Launched

Johns Hopkins University Applied Physics Laboratory Press Release  
October 25, 2006

NASA's STEREO (Solar TERrestrial Relations Observatory) spacecraft - en route as the first mission to capture the sun in 3-D - successfully launched tonight aboard a single Delta II vehicle from Cape Canaveral Air Force Station, Fla., at 8:52 p.m. EDT.

The two nearly identical spacecraft, designed, built and operated for NASA by the Johns Hopkins University Applied Physics Laboratory (APL), in Laurel, Md., separated from the launch vehicle 25 minutes after lift-off. After receiving the first signal from the spacecraft 63 minutes after launch, mission control personnel at APL confirmed each observatory's solar arrays successfully deployed and were providing power to the spacecraft. The initial radio signals were forwarded to the APL-based STEREO Mission Operations Center from NASA's Deep Space Network antennas in Canberra, Australia.

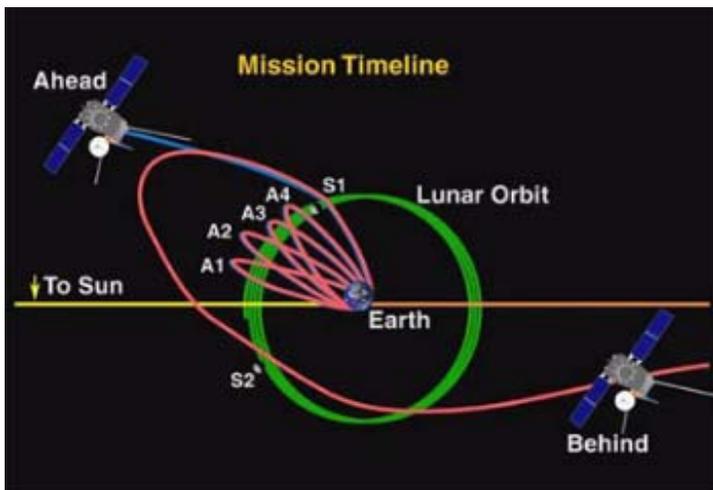
During its two-year mission, the twin observatories will explore the origin, evolution and interplanetary consequences of coronal mass ejections. These powerful solar eruptions are a major source of the magnetic disruptions on Earth and a key component of space weather, which can greatly affect satellite operations, communications, power systems, and the lives of astronauts in space.

## Placing STEREO into Orbit

For the next few weeks, the spacecraft will fly in an elliptical orbit that extends from Earth just beyond the moon. During this time, mission operations personnel at APL will place the spacecraft in flight mode, turn on and check out all instruments and subsystems, and ensure all systems are operating nominally in preparation to begin their data collection efforts.

In approximately two months, mission operations personnel at APL will synchronize spacecraft orbits and direct one observatory to its position ahead of Earth. In approximately three months, the second observatory will be redirected to its position trailing Earth. Just as the slight offset between your eyes provides you with depth perception, this placement will allow the STEREO observatories to obtain 3-D images and particle measurements of the sun.

Lunar swingbys will be used to place the observatories into their respective orbits, using the moon's gravity to redirect them to their appropriate orbits - something the launch vehicle alone can't do. This is the first time lunar swingbys have been used to manipulate orbits of more than one spacecraft. *Continued on next page*



This illustration shows the STEREO spacecraft trajectories. Credit: NASA

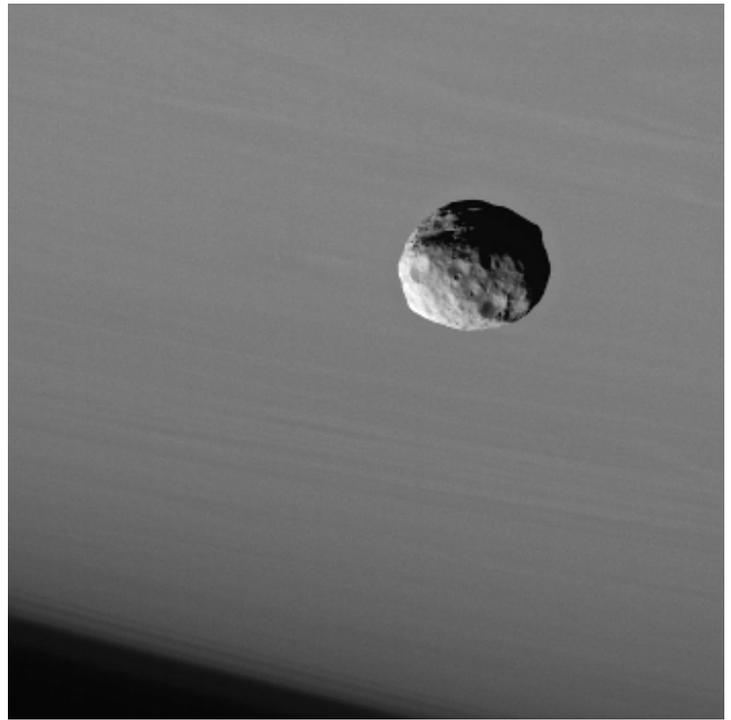


Image: NASA/JPL/Space Science Institute

## Superb View of Saturn's Janus

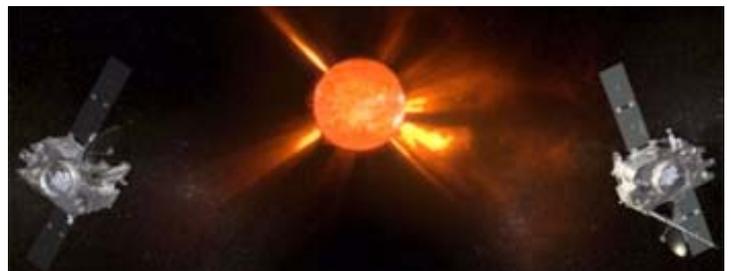
CASSINI PHOTO RELEASE, October 28, 2006

The Cassini spacecraft provides this dramatic portrait of Janus against the cloud-streaked backdrop of Saturn.

Like many small bodies in the solar system, Janus (181 kilometers, or 113 miles across) is potato-shaped with many craters, and the moon has a surface that looks as though it has been smoothed by some process. Like Pandora and Telesto, Janus may be covered with a mantle of fine dust-sized, icy material.

The image was taken using a spectral filter sensitive to wavelengths of infrared light centered at 930 nanometers. The view was acquired with the Cassini spacecraft narrow-angle camera at a distance of approximately 145,000 kilometers (90,000 miles) from Janus and at a Sun-Janus-spacecraft, or phase, angle of 62 degrees. North on Saturn is up. Image scale is 871 meters (2,858 feet) per pixel.

The Cassini-Huygens mission is a cooperative project of NASA, the European Space Agency and the Italian Space Agency. The Jet Propulsion Laboratory, a division of the California Institute of Technology in Pasadena, manages the mission for NASA's Science Mission Directorate, Washington, D.C. The Cassini orbiter and its two onboard cameras were designed, developed and assembled at JPL. The imaging operations center is based at the Space Science Institute in Boulder, Colo.



Artist's concept of STEREO spacecraft observing the sun. Credit: NASA

Each STEREO observatory is carrying two instruments and two instrument suites, providing more than a dozen instruments per observatory. APL designed and built the spacecraft platform housing the instruments. When combined with data from observatories on the ground or in space, STEREO's data will allow scientists to track the buildup and liftoff of magnetic energy from the sun and the trajectory of Earth-bound coronal mass ejections in 3-D.

STEREO's instruments were built by numerous organizations worldwide with a principal investigator, or PI, leading each instrument team. The instruments and PIs are as follows: Sun-Earth Connection Coronal and Heliospheric Investigation (SECCHI) – Russell Howard, Naval Research Laboratory; In situ Measurements of Particles and CME Transients (IMPACT) – Janet Luhmann, University of California, Berkeley; PLASMA and SupraThermal Ion Composition (PLASTIC) – Antoinette Galvin, University of New Hampshire; and STEREO/WAVES (S/WAVES) – Jean-Louis Bougeret, Paris Observatory, Meudon.

STEREO is the third mission in NASA's Solar Terrestrial Probes Program. STEREO is sponsored by NASA's Science Mission Directorate, Washington, D.C. NASA Goddard's Solar Terrestrial Probes Program Office, in Greenbelt, Md., manages the mission, instruments and science center. APL designed and built the STEREO spacecraft and will operate the twin observatories for NASA during the mission.

For more information about STEREO or to download images, visit [stereo.jhuapl.edu](http://stereo.jhuapl.edu).

## Spitzer Peels Back Layers of Star's Explosion

NASA/JPL NEWS RELEASE, October 26, 2006

Astronomers using NASA's infrared Spitzer Space Telescope have discovered that an exploded star, named Cassiopeia A, blew up in a somewhat orderly fashion, retaining much of its original onion-like layering.

"Spitzer has essentially found key missing pieces of the Cassiopeia A puzzle," said Jessica Ennis of the University of Minnesota, Minneapolis, lead author of a paper to appear in the Nov. 20 issue of the *Astrophysical Journal*.

"We've found new bits of the 'onion' layers that had not been seen before," said Dr. Lawrence Rudnick, also of the University of Minnesota, and principal investigator of the research. "This tells us that the star's explosion was not chaotic enough to stir its remains into one big pile of mush."

Cassiopeia A, or Cas A for short, is what is known as a supernova remnant. The original star, about 15 to 20 times more massive than our sun, died in a cataclysmic "supernova" explosion relatively recently in our own Milky Way galaxy. Like all mature massive stars, the Cas A star was once neat and tidy, consisting of concentric shells made up of various elements. The star's outer skin consisted of lighter elements, such as hydrogen; its middle layers were lined with heavier elements like neon; and its core was stacked with the heaviest elements, such as iron.

Until now, scientists were not exactly sure what happened to the Cas A star when it ripped apart. One possibility is that the star exploded in a more or less uniform fashion, flinging its layers out in successive order. If this were the case, then those layers should be preserved in the expanding debris. Previous observations revealed portions of some of these layers, but there were mysterious gaps.

Spitzer was able to solve the riddle. It turns out that parts of the Cas A star had not been shot out as fast as others when the star exploded. Imagine an onion blasting apart with some layered chunks cracking off and

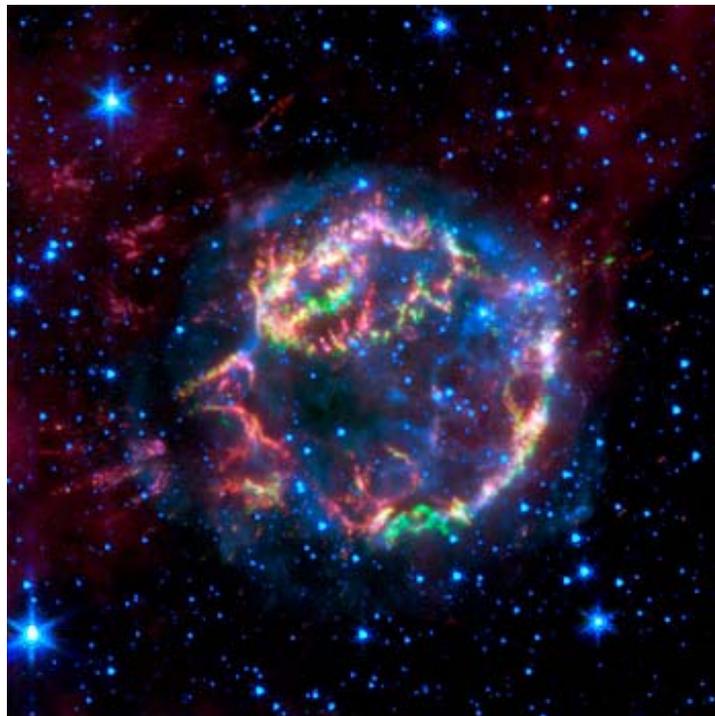
zooming away, and other chunks from a different part of the onion shooting off at slightly slower speeds.

"Now we can better reconstruct how the star exploded," said Dr. William Reach of NASA's Spitzer Science Center, Pasadena, Calif. "It seems that most of the star's original layers flew outward in successive order, but at different average speeds depending on where they started."

How did Spitzer find the missing puzzle pieces? As the star's layers whiz outward, they are ramming, one by one, into a shock wave from the explosion and heating up. Material that hit the shock wave sooner has had more time to heat up to temperatures that radiate X-ray and visible light. Material that is just now hitting the shock wave is cooler and glowing with infrared light. Consequently, previous X-ray and visible-light observations identified hot, deep-layer material that had been flung out quickly, but not the cooler missing chunks that lagged behind. Spitzer's infrared detectors were able to find the missing chunks - gas and dust consisting of the middle-layer elements neon, oxygen and aluminum.

Cassiopeia A is the ideal target for studying the anatomy of a supernova explosion. Because it is young and relatively close to our solar system, it is undergoing its final death throes right in front of the watchful eyes of various telescopes. In a few hundred years or so, Cas A's scattered remains will have completely mixed together, forever erasing important clues about how the star lived and died.

NASA's Jet Propulsion Laboratory, Pasadena, Calif., manages the Spitzer Space Telescope mission for NASA's Science Mission Directorate, Washington. Science operations are conducted at the Spitzer Science Center at the California Institute of Technology, also in Pasadena. Caltech manages JPL for NASA.



This image from Spitzer shows the scattered remains of an exploded star named Cassiopeia A. In this false-color image, the faint, blue glow surrounding the dead star is material that was energized by a shock wave, called the forward shock, which was created when the star blew up. The forward shock is now located at the outer edge of the blue glow. Stars are also seen in blue. Green, yellow and red primarily represent material that was ejected in the explosion and heated by a slower shock wave, called the reverse shock wave. Credit: NASA/JPL-Caltech

## Editor's Note

Most of the images in the Focal Point are in color, but you won't see that if you are getting the mailed version. You can download the full color version from the AAC web site each month. By reviewing the Focal Point over the Internet instead of having it mailed, you can save the club about \$12 a year in printing and mailing costs. It may not sound like much, but the more people that use the Internet to receive the Focal Point, the more money the club will have to support its other activities. Just send an email to Kat Sarbell (FocalPoint@AtlantaAstronomy.Org) requesting that your name be removed from the Focal Point mailing list.

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## Georgia Astronomy in State Parks (GASP) Events

There is one remaining GASP event for 2006:

**November 11th** - Florence Marina State Park

For more information about this event, contact Joanne Cirincione at [Starrynights@AtlantaAstronomy.org](mailto:Starrynights@AtlantaAstronomy.org)



*The GASP volunteers at FDR State Park on Labor Day weekend 2004 - From left to right: Joanne Cirincione, Keith Burns, Harold and Claudia Champ with Ginger, Peter Macumber, Sharon Carruthers, Tom Faber, Kat Sarbell, and Holly and John Ritger.*

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## Atlanta Astronomy Club Website

While this newsletter is the official information source for the Atlanta Astronomy Club, it is only up to date the day it is printed. So if you want more up to date information, go to our club's website. The website contains pictures, directions, membership applications, events updates (when available) and other information. <http://www.atlantaastronomy.org>

The **Atlanta Astronomy Club, Inc.**, the South's largest and oldest astronomical society, meets at **8:00 P.M.** on the third Friday of each month at Emory University's White Hall or occasionally at other locations or times. Membership is open to all. Membership fees are **\$30** for a family or single person membership. College Students membership fee is **\$15**. These fees are for a one year membership.

Magazine subscriptions to *Sky & Telescope* or *Astronomy* can be purchased through the club for a reduced rate. The fees are **\$33** for Sky & Telescope and **\$34** for Astronomy. Renewal forms will be sent to you by the magazines. Send the renewal form along with your check to the Atlanta Astronomy Club treasurer.

**The Club address:** Atlanta Astronomy Club, Inc., P.O. Box 76155, Atlanta, GA 30358-1155.

Atlanta Astronomy Club Hot Line: Timely information on the night sky and astronomy in the Atlanta area. Call **770-621-2661**.

AAC Web Page: <http://www.AtlantaAstronomy.Org>

Send suggestions, comments, or ideas about the website to [webmaster@AtlantaAstronomy.org](mailto:webmaster@AtlantaAstronomy.org). Also send information on upcoming observing events, meetings, and other events to the webmaster.

## AAC Officers and Contacts

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## Directions to White Hall at Emory

Meeting Location Information:

Turn onto Dowman Drive from North Decatur Road at the five way intersection (across from Everybody's Pizza). White Hall is located on the right across from the new Science & Math building. Parking is available along Dowman Drive on both sides of the road. There is also a gated parking lot on the left behind the Admissions Building. After 6PM there is no fee to park there. For more detailed directions on how to get to Emory University, visit [www.atlantaastronomy.org](http://www.atlantaastronomy.org).

## Calendar by Tom Faber (All times EST unless noted)

- November 5th, Sunday: **Tentative Date for next AAC Board Meeting.** Full Moon (Hunter's Moon).
- November 8th, Wednesday: Mercury Inferior Conjunction - Transits the Sun.
- November 10th, Friday: Bradley Observatory Open House, 8PM, Agnes Scott College, Miller Goss - National Radio Astronomy Observatory
- November 11th, Saturday: **GASP at Florence Marina State Park - see pg 7. CEC Meeting.**
- November 17th, Friday: **AAC Meeting at White Hall, 8PM, Emory University.** Moon Last Quarter. Leonid Meteors.
- November 18th, Saturday: **DSO at Woodruff - Contact Daniel Herron for details.**
- November 20th, Monday: New Moon.
- November 21st, Tuesday: Jupiter Conjunction with Sun.
- November 25th, Saturday: Mercury Greatest Western Elongation.
- November 28th, Tuesday: Moon First Quarter.
- December 3rd, Sunday: Moon Occults M45.
- December 4th, Monday: Full Moon.
- December 7th, Thursday: Earliest Sunset (~5:27 PM EST at Atlanta)
- December 8th, Friday: **AAC Christmas Pot Luck Dinner, 7:00 PM at Emory Math and Sciences Building - see pg 2.** Bradley Observatory Open House, 8PM, Agnes Scott College, Christopher De Pree - Associate professor of astronomy and chair, Agnes Scott.
- December 9th, Saturday: **CEC Meeting.** Mercury near Mars & Jupiter.
- December 12th, Tuesday: Moon Last Quarter.
- December 13th, Wednesday: Geminid Meteors.
- December 20th, Wednesday: New Moon.
- December 21st, Thursday: Solstice 7:22 PM
- December 23rd, Saturday: Ursid Meteors.

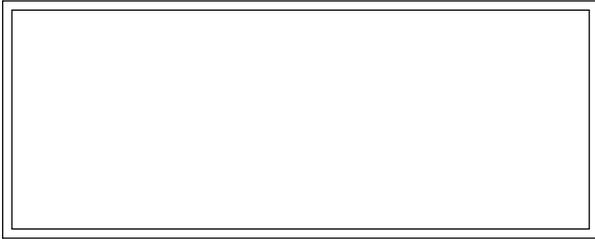
## Atlanta Astronomy Club Listserve

Subscribe to the Atlanta Astronomy Club Mailing List: The name of the list is: AstroAtlanta. The address for messages is: AstroAtlanta@yahoogroups.com . To add a subscription, send a message to: AstroAtlanta-subscribe@yahoogroups.com . This list is owned by Lenny Abbey.

## Focal Point Deadline and Submission Information

Please send articles, pictures, and drawings in electronic format on anything astronomy related to Kat Sarbell at [focalpoint@atlantaastronomy.org](mailto:focalpoint@atlantaastronomy.org). Please send images separate from articles, not embedded in them. Articles are preferred as plain text files but Word documents are okay. You can submit articles anytime up and including the deadline date. **The deadline for December is Thursday, November 30th at 4:00 PM ... Submissions will no longer be accepted after the deadline.**

## FIRST CLASS



Newsletter of The Atlanta Astronomy Club, Inc.

FROM:

Kat Sarbell

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We're here to help! Here's how to reach us:

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