

The Focal Point

The Atlanta Astronomy Club
Established 1947
August 2016

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Editor: Tom Faber

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August AAC General Meeting

Editor's Note: John Sinclair was unable to be at our July meeting due to car trouble. He is now scheduled to present this talk at the August Meeting.

Please join us for the next general meeting of the Atlanta Astronomy Club, to be held on Saturday, August 20th at 3PM at the Fernbank Science Center. A short beginner's program will be presented at 2PM. Our featured speaker will be John Sinclair.

The Talk

John Sinclair will present a talk titled "Pisgah Astronomical Research Institute - 2016 and beyond." John's talk will be about what is happening at the Pisgah Astronomical Research Institute (PARI), which is located west of Brevard, North Carolina in the Pisgah National Forest. The PARI site was originally built in the early 1960s as a NASA tracking site. The site was no longer needed by NASA and in 1981 was turned over to the Department of Defense. DoD used it to communicate with satellites until 1995 when the facility was closed and its functions were moved elsewhere. In 1999 the Pisgah Astronomical Research Institute took over operation of the site for research and educational purposes. See <http://www.pari.edu/>

Speaker Bio

As a native of North Carolina, I learned at a young age that the ground beneath us held natural treasures. I've been an avid gem and mineral collector since the 1980's and a meteorite collector, hunter and dealer since 1996. I have an IT degree from Guilford Tech and I'm



The "smiley" face on PARI's 4.6m radio telescope was painted as a joke during the height of the Cold War. The Soviet Union was intensely interested in the DOD base and often sent satellites to photograph the campus. Each Soviet photo contained a "smiley face" as a friendly wave. Today "Smiley" is a student favorite and is used remotely via the internet by middle and high school students and teachers to study radio astronomy. Photo credit PARI.

trained as a bench jeweler. I enjoy hunting for rocks and minerals most everywhere I travel and for meteorites when I get in a good area to find them. I work at Pisgah Astronomical Research Institute, just north of Brevard, NC as the Curator of Meteorites and Minerals. My current project is helping build a meteorite and mineral museum on the PARI campus.

The Next AAC Board Meeting

The next Board of Directors Meeting of the AAC is scheduled for Sunday, August 14th, starting at 3PM at the home of Peter and Sharon, 1057 Trestle Drive, Austell. Contact AAC President Mark Banks or Board Chair Sharon Carruthers for more information. Any member of the club who has any questions, concerns, or issues about club operations is welcome to attend the meeting and address the Board.

July AAC Meeting Report

Photos by Tom Faber.

The July AAC general meeting was held on Saturday, July 16th at the Fernbank Science Center. About 50 members and guests were present. President Mark Banks presented a short beginner's program at 2PM. The general meeting began at 3PM. Our featured speaker, John Sinclair, was unable to make the meeting due to car trouble. He is now scheduled to present his PARI talk at the August meeting on the 20th. Club member Richard Jakiel (photo bottom right) filled in and presented a talk on basic imaging using a DSLR camera. Rich showed a number of very good images he has made from his suburban back yard and talked about the equipment and techniques he uses.

After his talk Rich answered a number of questions.

After the Q&A session there were announcements by Club officers about upcoming events and activities.

Then after the meeting adjourned a number of attendees went to Athens Pizza for dinner and more astronomy discussions.



The Astronomical League

As a member of the **Atlanta Astronomy Club** you are automatically also a member of the **Astronomical League**, a nation wide affiliation of astronomy clubs. Membership in the AL provides a number of benefits for you. They include:

- * You will receive *The Reflector*, the AL's quarterly newsletter.
- * You can use the Book Service, through which you can buy astronomy-related books at a 10% discount.
- * You can participate in the Astronomical League's Observing Clubs. The Observing Clubs offer encouragement and certificates of accomplishment for demonstrating observing skills with a variety of instruments and objects. These include the Messier Club, Binocular Messier Club, the Herschel 400 Club, the Deep Sky Binocular Club, and many others.

To learn more about the Astronomical League and its benefits for you, visit <http://www.astroleague.org>

The 2016 Peach State Star Gaze

Mark your calendars for the 2016 Peach State Star Gaze which will be held from Sunday, September 25 to Sunday, October 2 at the Deerlick Astronomy Village! Stay tuned to upcoming issues of the *Focal Point* and the AAC web sites for details on the talks, speakers, and other activities that will be held during the Star Gaze. And of course there will be lots of observing under some of the darkest skies in Georgia. The new moon occurs on Friday, September 30. Micki's Kitchen is also scheduled to return with meals, sandwiches, hot coffee, hot chocolate and other drinks, and her famous brownies! See you there!



The AAC field at the DAV during the 2013 PSSG - Photo by Tom Faber.

The Next Charlie Elliott Meeting

Meeting Details

Studying Low Mass Stars

Join us August 6th, 2016 at 6:00 p.m. (room TBA) for a unique and informative discussion with Georgia State University PhD candidate, Tiffany Clements. When Tiffany and I were discussing topics, we considered her other areas of research which include Centaurs, a specific class of asteroids with highly chaotic orbits between Jupiter and Neptune, as well as the formation and evolution of spectral class B stars, a great example of which is Achernar, in the constellation Eridanus, for those of you working through related Astronomical League programs. We finally settled on her current area of research, which involves mapping the properties of low mass stars through variability monitoring and spectroscopy to understand what affects their sizes as well as their positions on the main sequence. Low mass stars are stars with less than half the mass of the Sun and are the smallest, coolest, and most dim stars in the main sequence. They are orange, red, or brown in color, consume their hydrogen fuel very slowly and, as a result, have long lives. If you're an astrophotographer looking for a new challenge, or if you've completed, are currently working through, or are thinking about starting any of the Astronomical League's observing programs involving specific types of

stars or stellar evolution, this will be right up your alley. As always, be prepared to learn something new!

Growing up in Ohio, Tiffany had an interest in astronomy for as long as she could remember. It wasn't until her senior year of high school during a physics class that she decided to make astronomy a career path. Tiffany completed her undergraduate degree at the University of Toledo in Toledo, Ohio. While in college, Tiffany worked at the Ritter Planetarium in Toledo, Ohio and that experience pushed her to pursue astronomy even further at Georgia State University. Tiffany's long term goal is to inspire public interest in science and astronomy through work at a planetarium, space museum, observatory, or university.

All of the Above!

Charlie Elliott Astronomy Observing Supervisor David Whalen will reprise his stand up comedy routine and might even talk about what you can expect to see in the sky this month with binoculars and small telescopes, as well as the monthly observing challenge.

Observing After the Meeting

All are invited to Jon Wood Astronomy Field immediately after the meeting (weather-permitting). The event is free and everyone is welcome.

Minutes & Handouts: The minutes, handouts, and presentations from past meetings of Charlie Elliott Astronomy are available for download on our Past Events web page, <http://ceastronomy.org/blog/events>. Monthly sky maps are available from skymaps.com.

Meeting dates for the remainder of the year are: August 6, September 10 (potluck), October 29, November 19, December 10 (potluck).

The July Charlie Elliott Meeting

By Brian Tucker, Charlie Elliott Chapter Recording Secretary

The July monthly meeting for the Charlie Elliott Chapter of the Atlanta Astronomy Club was held on 7/9/16 in the Charlie Elliott Wildlife Management property in Mansfield, Georgia.

Tim Geib, Chapter Director, called the meeting to order at 6:00 p.m. and welcomed everyone. There were twenty-four attendees with four guests in attendance.

David Whalen, Observing Director, treated us to another exciting episode of "All of the Above", which gives a run-down of what you can expect to see in the sky in the coming weeks. The theme of this month's presentation was "Pluto: Dwarf Planet of the Month" accompanied by the ever-popular "It's a Small World" by Disney.

Notable Celestial Events for July are:

July 4: Juno mission SUCCESSFULLY arrives at Jupiter!

July 7: Pluto at Opposition

July 18: Pluto-Moon conjunction

July 30: See 8 planets in one night!

In other business, there were several outreach events discussed for this month:

July 11: Garden Club of Georgia Youth at Charlie Elliott

July 14: Outdoor Wildlife Leadership School at Charlie Elliott

July 21: Adventures in Conservation Education at Charlie Elliott

August 26: Peachtree Corners - Gwinnett Park - Strictly Observing from 9-11 PM

*It was noted that doing these events at Charlie Elliott is how we are able to continue using the facilities that we have here. Participation is highly encouraged by all members so that we are able to keep these services.

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There was one award presented this month and two achievements announced:

AWARD: Theo Ramakers finished the Analemma program, which is a huge year-long challenge to document the Sun's position every day or two, with the goal of figuring out the tilt of the Earth's axis. He's the 13th person to complete this challenge!

ACHIEVEMENT: Marie Lott completed the Herschel 400

AWARD: Phil Sacco was awarded the Globular Cluster award last month. The monthly program was delivered by Phil Sacco entitled "What's left when you take the 'myth' out of 'mythology'?". Phil is one of a few Master Astronomers in Georgia, and is most likely the only one on the east coast that has studied in-depth the mythology around how the stars and constellations got their names.

Due to the massive thunderstorm before, during, and after the meeting, there was no observation on the Jon Wood Astronomy Field.



Photos courtesy of Steve Seidentop

This month's observing challenge is NGC 6337, the Cheerio Nebula in Scorpius. This month's astrophotography target is: M13, as known as the Hercules Cluster.

From the President's Desk

By Mark Banks, AAC President

Future programs: Our program chair, Rich Jakiel, has devoted much time and effort to making sure we have great programs available at every monthly meeting. Rich will now be moving on to other projects. In order to continue to provide interesting and diverse programs we have decided to go to a 3 person program committee. We have 2 volunteers now and would like to have a 3rd member to complete the committee. If you are interested in participating please let me know.

In order to keep our programs relevant and interesting for the club we need member input on possible future program subjects and/or speakers. Please contact any of the club officers with your ideas so we can get something going on what you want.

Peach State Star Gaze (PSSG): Registration will be open soon so please make plans now to join us at the Deerlick Astronomy Village site. Dates for this year's event are Sunday September 25th – Sunday October 2nd. You can come for just one day or all week. This is our largest annual event & fundraiser. We will let you know as soon as registration is open.

Hubble Looks to the Final Frontier

STScI News Release - July 21, 2016

Celebrating its 50th anniversary this year, the TV series "Star Trek" has captured the public's imagination with the signature phrase, "To boldly go where no one has gone before." NASA's Hubble Space Telescope doesn't "boldly go" deep into space, but it is "boldly peering" deeper into the universe than ever before to explore the warping of space and time and uncover some of the farthest objects ever seen.

When "Star Trek" was first broadcast in 1966, the largest telescopes on Earth could only see about halfway across the universe — the rest was uncharted territory. But Hubble's powerful vision has carried us into the true "final frontier."

This is epitomized in the latest Hubble image released today in time for the new motion picture "Star Trek Beyond." The Hubble image unveils a very cluttered-looking universe filled with galaxies near and far. Some are distorted like a funhouse mirror through a warping-of-space phenomenon first predicted by Einstein a century ago.

In the center of the image is the immense galaxy cluster Abell S1063, located 4 billion light-years away, and surrounded by magnified images of galaxies much farther.

Thanks to Hubble's exquisite sharpness, the photo unveils the effect of

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This image is a composite of separate exposures acquired by the WFC3/IR and ACS/WFC instruments. Several filters were used to sample various wavelengths. The color results from assigning different hues (colors) to each monochromatic (grayscale) image associated with an individual filter. In this case, the assigned colors are:

Blue: ACS/WFC F435W (B) + F606W (R)

Green: ACS/WFC F814W (I) + WFC3/IR F105W (Y)

Red: WFC3/IR F125W (J) + F140W (JH) + F160W (H)

NASA, ESA, and J. Lotz (STScI)



This image fits the Lagoon Nebula (M8) and the Trifid Nebula (M20), both in Sagittarius, on one full frame with the Esprit 150 refractor and a field flattener. This is a single 60 second sub that has been resized. Anyway, looks like M20 is a fastball heading into a catchers mitt (M8).

Images by Dan Llewellyn



Waning gibbous moon in color taken using an Esprit 150 APO refractor. Image taken June 25, 2016 at 03:26EST. The moon was then 20.2 days past new and 76.7% illuminated.



This image by Dan shows a nearly full moon with a nice corona in the clouds around the moon. Coronae are produced by the diffraction of light by tiny cloud droplets. In rare cases several concentric rings of different colors are visible, but this requires the cloud droplets to be very uniform in size. This image was made with just the camera on a tripod of the 91% illuminated Moon on July 17, 2016 at Deerlick Astronomy Village. This was a single shot, no cut and paste, no merging: a shot of the moon and then a shot of the clouds.

space warping due to gravity. The huge mass of the cluster distorts and magnifies the light from galaxies that lie far behind it due to an effect called gravitational lensing. This phenomenon allows Hubble to see galaxies that would otherwise be too small and faint to observe. This “warp field” makes it possible to get a peek at the very first generation of galaxies. Already, an infant galaxy has been found in the field, as it looked 1 billion years after the big bang.

This frontier image provides a sneak peak of the early universe, and gives us a taste of what the James Webb Space Telescope will be capable of seeing in greater detail when it launches in 2018.

The cluster contains approximately 100 million-million solar masses, and contains 51 confirmed galaxies and perhaps over 400 more.

The Frontier Fields program is an ambitious three-year effort, begun in 2013, that teams Hubble with NASA’s other Great Observatories — the Spitzer Space Telescope and the Chandra X-ray Observatory — to probe the early universe by studying large galaxy clusters. Identifying the magnified images of background galaxies within these clusters will help astronomers to improve their models of the distribution of both ordinary and dark matter in the galaxy cluster. This is key to understanding the mysterious nature of dark matter that comprises most of the mass of the universe.

Juno Is at a Turning Point

NASA/SWRI News Release - July 29, 2016

Five years after departing Earth, and a month after slipping into orbit around Jupiter, NASA’s Juno spacecraft is nearing a turning point. On July 31 at 12:41 p.m. PDT (3:41 p.m. EDT), Juno will reach the farthest point in its orbit of Jupiter for the first time, known as “apojove,” 5 million miles (8.1 million kilometers) from the giant planet. After that point, Jupiter’s gravitational grip on Juno will cause the spacecraft to begin falling back toward the planet for another pass, this time with its scientific eyes wide open.

The spacecraft is currently executing the first of two long orbits prior to beginning its science mission. Each capture orbit is nearly two months long -- quite the wait for the mission’s eager team of scientists -- but it’s

nothing compared to the long wait the team endured on the trek to Jupiter.

Juno launched on Aug. 5, 2011. The spacecraft took a long, looping path around the inner solar system to set up an Earth flyby, in which our planet’s gravity flung the spinning probe onward toward Jupiter.

“For five years we’ve been focused on getting to Jupiter. Now we’re there, and we’re concentrating on beginning dozens of flybys of Jupiter to get the science we’re after,” said Scott Bolton, Juno principal investigator at Southwest Research Institute in San Antonio.

Juno arrived at Jupiter on July 4, firing its main rocket engine as planned for 35 minutes. The flawless maneuver allowed Jupiter’s gravity to capture the solar powered spacecraft into the first of two 53.4-day-long orbits, referred to as capture orbits. Following the capture orbits, Juno will fire its engine once more to shorten its orbital period to 14 days and begin its science mission.

But before that happens, on Aug. 27, Juno must finish its first lap around Jupiter, with a finish line that represents the mission’s closest pass over the gas giant. During the encounter, Juno will skim past Jupiter at a mere 2,600 miles (4,200 kilometers) above the cloud tops.

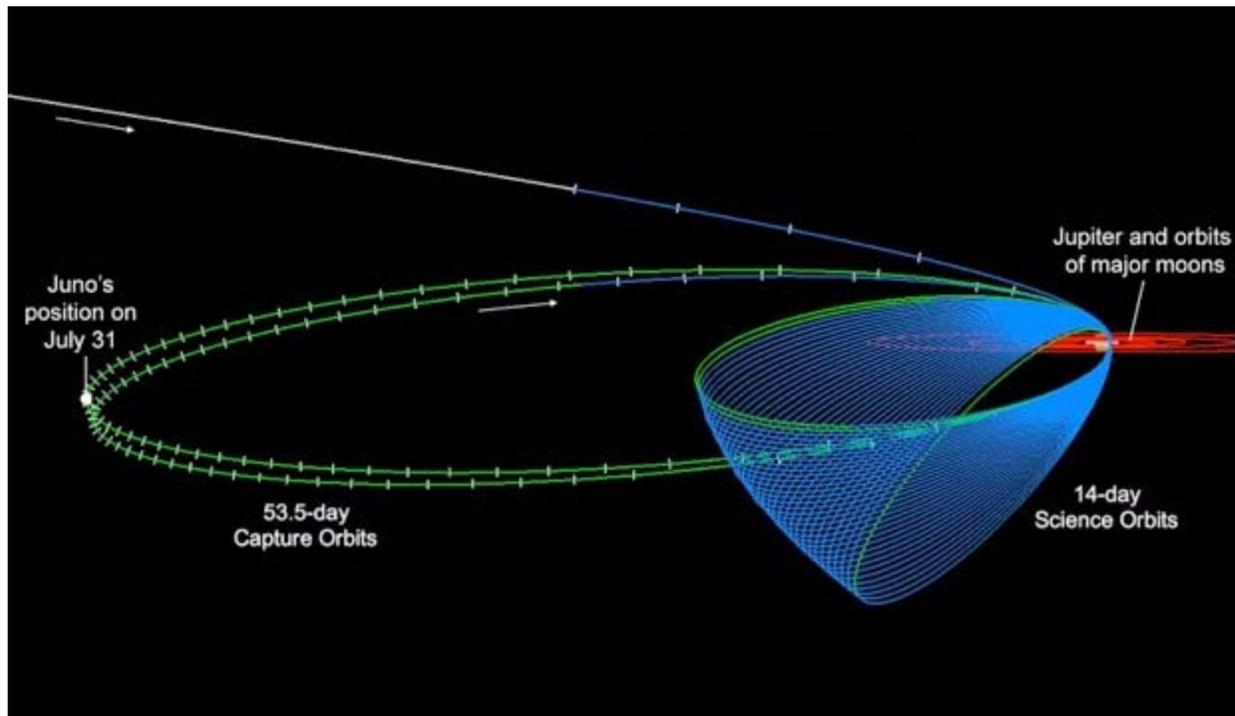
Juno’s science instruments were turned off during orbit insertion, to simplify spacecraft operations during that critical maneuver. In contrast, all the instruments will be collecting data during the Aug. 27 pass, which serves as a trial run before the mission gets to work collecting the precious data it came for.

“We’re in an excellent state of health, with the spacecraft and all the instruments fully checked out and ready for our first up-close look at Jupiter,” said Rick Nybakken, Juno project manager at NASA’s Jet Propulsion Laboratory, Pasadena, California.

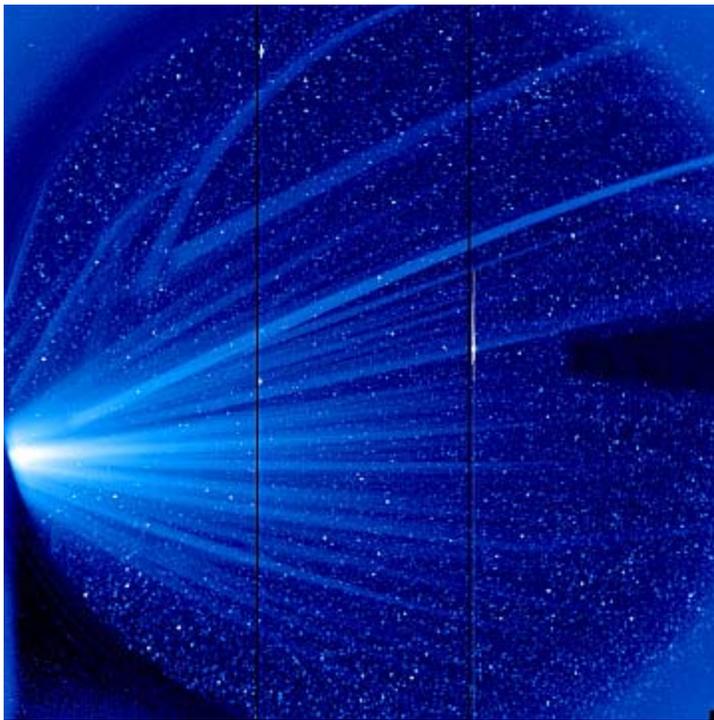
With its powerful suite of science instruments, Juno will probe Jupiter’s deep structure, atmospheric circulation and the high-energy physics of its magnetic environment. What Juno finds there will reveal important clues to Jupiter’s formation and evolution, along with insights about how our planetary system and others are built.

JPL manages the Juno mission for the principal investigator, Scott Bolton, of Southwest Research Institute in San Antonio. Juno is part of NASA’s New Frontiers Program, which is managed at NASA’s Marshall Space

Flight Center in Huntsville, Alabama, for NASA’s Science Mission Directorate. Caltech in Pasadena manages JPL for NASA.



This diagram shows the Juno spacecraft’s orbits, including its two long, stretched-out capture orbits. The spacecraft’s position on July 31 is indicated at left. Credit: NASA/JPL-Caltech



Micrometeor Impact on STEREO Spacecraft

This image from the SECCHI HI2 telescope on STEREO Ahead shows the result of a micrometeor impact on the spacecraft that occurred on May 6, 2016. A small dust particle hit the thermal blanket at high velocity near the telescope, and sent out a spray of tiny debris particles. Such events are actually very common, but they're usually not seen so clearly, because the normal data are a combination of many images covering a long time frame. However, in this case, the telescope was in a rare single-image mode, and was lucky enough to catch the event in one of the images. Even in this single image, the exposure time was 50 seconds, so the ejected blanket particles show up as long streaks.

Image Credit: NASA/GSFC/Stereo Project

The **Atlanta Astronomy Club, Inc.**, one of the South's largest and oldest astronomical society, meets at **3:00 P.M.** on the 2nd Saturday of each month at the Fernbank Science Center in Decatur, or occasionally at other locations or times. 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. AAC Web Page: <http://www.AtlantaAstronomy.org>. Send suggestions, comments, or ideas about the website to webmaster@AtlantaAstronomy.org. Also send information on upcoming observing events, meetings, and other events to the webmaster.

Atlanta Astronomy Club Online

While this newsletter is the official information source for the Atlanta Astronomy Club, it is only up to date the day it is posted. So if you want more up to date information, go to our club's website. The website contains pictures, directions, membership applications, events, updates, and other information. <http://www.atlantaastronomy.org> You can also follow the AAC on Facebook by joining the AAC group, and on Twitter at <http://twitter.com/atlaastro>.

AAC Officers and Contacts

President: Mark Banks President@AtlantaAstronomy.org

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Observing Chair: Daniel Herron Observing@AtlantaAstronomy.org

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PSSG Co-Chair: Open

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sidewalkastronomy@AtlantaAstronomy.org

Light Trespass: Ken Edwards, Contact info TBA

Woodruff Observ. Coordinator: Sharon Carruthers
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AAC Webmaster: Daniel Herron
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Calendar by Tom Faber (Times EDT/EST unless noted)

AAC Events are listed in BOLD

- Aug 2nd, Tuesday: New Moon.
- Aug 4th, Thursday: Moon near Mercury.
- Aug 5th, Friday: Moon near Jupiter.
- Aug 6th, Saturday: **CE Chapter Meeting, DSO at Brasstown Bald.**
- Aug 10th, Wednesday: Moon First Quarter.
- Aug 11-12th, Thursday: Perseid Meteor Shower peaks.
- Aug 18th, Thursday: Full Moon.
- Aug 20th, Saturday: **AAC Mfg at Fernbank Science Center 3:00PM.**
- Aug 23rd, Tuesday: Mars, Saturn, and Antares form a near straight line.
- Aug 24th, Wednesday: Moon Last Quarter.
- Aug 27th, Saturday: Venus and Jupiter less than 0.5° apart!
- Sept 1st, Thursday: New Moon.
- Sept 2nd, Friday: Moon near Jupiter.
- Sept 3rd, Saturday: **DSO at Deerlick Astronomy Village.**
- Sept 9th, Friday: Moon First Quarter.
- Sept 12th, Monday: Mercury at Superior Conjunction.
- Sept 16th, Friday: Full Moon.
- Sept 17th, Saturday: **AAC Mfg at Fernbank Science Center 3:00PM.**
- Sept 23th, Friday: Moon Last Quarter.
- Sept 25th, Sunday: **The Peach State Star Gaze opens 12:00PM.**
- Sept 26th, Monday: Jupiter conjunction with Sun.
- Sept 29th, Thursday: Moon near Mercury.
- Sept 30th, Friday: New Moon.
- Oct 2nd, Sunday: **The Peach State Star Gaze closes.**

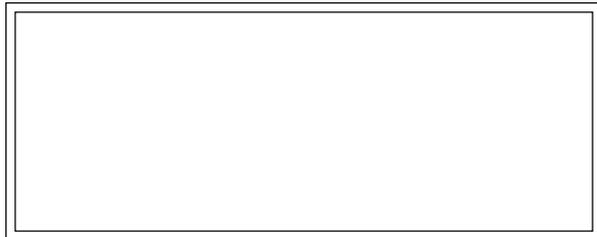
For more event listings see the calendar at www.atlantaastronomy.org

Atlanta Astronomy Club Listserv

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 .

Focal Point Deadline and Submission Information

Please send articles, pictures, and drawings in electronic format on anything astronomy, space, or sky related to Tom Faber at focalpoint@atlantaastronomy.org. Please send images separate from articles, not embedded in them. Articles are preferred as plain text files but Word documents or PDF's are okay. You can submit articles anytime up to the deadline. **The deadline for September is Saturday, August 27. Submissions after the deadline will go in the following issue.**



FIRST CLASS



www.bctagg.com



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

Newsletter of The Atlanta Astronomy Club, Inc.



The Focal Point

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