

The Focal Point

The Atlanta Astronomy Club
Established 1947
May 2015

Vol. 27 No. 12

Editor: Tom Faber

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May General Meeting & Elections

Please join us for the next meeting of the Atlanta Astronomy Club, to be held on Saturday, May 9th at **3PM at the Fernbank Science Center**. Since Fernbank closes at 5PM on Saturdays we will now begin our meetings at 3PM. A short beginner's program will be presented at 2PM. The General Meeting will start at 3PM. Our featured speaker will be AAC Observing Chair Daniel Herron.

We will also hold elections for club officers and board members. Members please attend if possible so we will have a quorum for elections.

After the talk and elections, upcoming club events and programs will be announced by the club officers.

The Talk

For our May meeting AAC Observing Chair Daniel Herron will present a talk about the International Space Station (photo top right). Daniel's talk will cover the construction and operation of the ISS, the countries involved, and research conducted on board the ISS.

Future Meetings will be on the 2nd Saturday

The AAC meetings are now on the second Saturday of each month, still at the Fernbank Science Center and at 3PM. The next few meeting dates are: June 13, July 11, Aug 8, & Sept 12.



Photo by NASA/JSC

March was Membership Renewal Month

The AAC has moved to a "one-date-for-all" membership renewal. ALL CLUB MEMBERS, with certain exceptions, should submit their \$30 dues for 2015 by the end of March. If you have not yet renewed please do so as soon as possible. Please send your renewals to AAC Treasurer Sharon Carruthers, renew online using PayPal, or you can bring your renewal to the April Meeting. For more information see: http://atlantaastronomy.org/?page_id=22

Thank You for your support of the AAC!

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>

April AAC General Meeting Report

By Alan Coffelt, AAC Recording Secretary.

Meeting Photos by Tom Faber unless noted otherwise

This month's general meeting was on Saturday, April 11th starting at 3pm at the Atlanta Freethought Society Building. There were 35 members and guests present for the meeting.

Our speakers were AAC program Chair Richard Jakiel and AAC member Marie Lott, who talked about the remarkable history of Sir William Herschel, his much younger sister, Caroline Herschel (presented by Marie), and son, Sir John Herschel. Following are some highlights from the talk.

William began life in Hanover (Saxony) in 1738. He moved to England after the 7 Years War in 1759, and eventually became an accomplished professional musician and also taught and wrote music. But his life's passion in astronomy grew after meeting Nevil Maskelyne (Astronomer Royal). He learned about optics and grinding and polishing his own mirrors from the alloy speculum and his first major telescope was a 6.2 inch f/13 Newtonian. Soon, William's telescopes were superior to those used at the Greenwich observatory at the time. He ultimately made over 400 telescopes, including very large ones like the 18 inch (20 foot long) telescope and the 49.5 inch (40 foot long) monster telescope, which was especially difficult to use.

In 1779, William began systematic observations. He first searched for double stars, then for deep sky or nonstellar objects, of which he discovered hundreds. In 1781 he discovered Uranus, which was originally called "Herschel" or Georgium Sidis (or "George's Star"). By 1792, William had published three catalogs, including 800 confirmed double stars, and 2500 deep sky objects using his 12 inch and 18.7 inch telescopes. William also was the first to document changes in Mars polar cap and discovered satellites Mimas, Enceladus, Titania, and Overon.

During the 112 sweeps of the sky William Herschel conducted between 1783 and 1802, Caroline Herschel assisted with note taking and calculations. As a child, Caroline suffered disfigurement from smallpox and stunted growth from typhus, which killed one of her siblings, and was assumed, would never marry and remain a house servant her entire life. Her life changed for the better, when William brought her to his home in England, where he taught her to sing and to transcribe musical scores.

As William became more interested in astronomy, Caroline, who preferred singing, was reluctant at first to help with observational notes, calculations, and with preparing mirrors, but soon became a key part of the operation. If it were not for her careful work and organization, William's career might not have been as successful. William even made Caroline her own smaller telescope, and gifted larger ones to her in later years. By 1783, Caroline's expertise had grown to the point she knew the names of every star down to 4th magnitude by sight, and could find objects M1-M68 in under a minute. From 1786 to 1797, Caroline Herschel discovered eight comets, and became known as the "Comet Hunter." Along with her help cataloging objects for William, she indexed, corrected, and organized a catalog by John Flamsteed, and worked with her nephew, Sir John Herschel, to publish a catalog of nebulae. Two catalogs published by Caroline are still in use today.

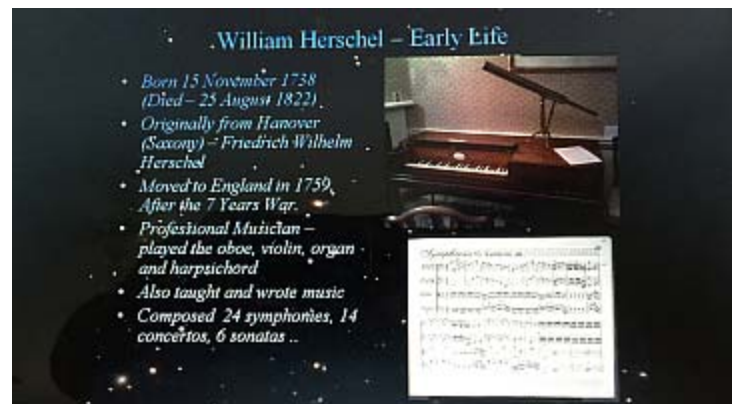
Sir John Herschel, the son of William, had the advantage of a formal education, and was a mathematician, astronomer, chemist, inventor, experimental photographer, and botanist. He was also a bit of an artist, and sketched what he saw at the eyepiece. What William did for the northern hemisphere, his son John did for the southern hemisphere. Starting in 1834 from near Cape Town, John used the 20 inch telescope to identify 1600 new objects. With the catalogs already in use, and adding his discoveries, John later compiled the General Catalog, later to become the New General Catalog in use today.

After the talk, there were club announcements about upcoming events. Members are welcome to the Deerlick Astronomy Village Memorial Day picnic on Sunday May 24th for socializing and observing that evening. For future speaker programs and upcoming club event details and observing programs, see the club calendar.

Editor's Note: We had a special visitor at the April Meeting. Eugenia Abbey, wife of the late Leonard B. Abbey, a lifetime AAC member, was present at the meeting. It was good to see Eugenia at a meeting again. (For new members who may not have known Lenny see the January 2013 *Focal Point*).



The 4 photos below are by Alan Coffelt



Continued on next page

But Music was not his life's passion...

- His interest in astronomy grew after meeting Nevil Maskelyne (Astronomer Royal)
- Learned optics and was soon grinding his own mirrors
- First major scope was a 6.2-inch f/13 Newtonian
- His scopes were superior to those used by major observatories




Catalogues of Stars

Caroline catalogued every discovery she and William had made.


She later published her own work cataloguing stars and nebulae.

She indexed, corrected, and organized a catalogue by John Flamsteed, and she worked with John Herschel, William's son, to publish a catalog of nebulae.

Two of the astronomical catalogues published by Caroline Herschel are still in use today.



John, the artist...



The nebula M11, as drawn by John Herschel in 1826. An observer in the central cluster would see bright stars scattered all round the sky, and a faint, hazy, nebulae over - much as we ourselves do.

March was Membership Renewal Month

If you have not yet renewed your AAC membership for 2015 please send it to Sharon as soon as possible! Thank You for your support of the AAC!

Editor's Note - Zombie Party

The Zombie Party detailed below that was scheduled to be held on April 16-19 was cancelled due to rain/clouds on all three nights. AAC Observing Chair Daniel Herron has rescheduled the Star Party for May 14-17th (3 nights), again weather permitting. If you are interested in attending the May Zombie Party at the Deerlick Astronomy Village you may contact Daniel at Observing@AtlantaAstronomy.org for more details.

The AAC Zombie Party

By Daniel Herron, AAC Observing Chair

This year's Zombie Party is scheduled for Thursday, April 16 thru Sunday, April 19 (3 nights) at the Deerlick Astronomy Village.

The Zombie party is a no-frills, open to the public, 3 night star party hosted by the Atlanta Astronomy club. No speakers, workshops or sessions just observing. This event is open to all, beginners and, experts alike, AAC members, and non-members (how else are we going to get you hooked!).

Cost is 10 dollars per night per person.

No pre-registration necessary, pay once you arrive. This cost covers the fee to use the field (\$5 per person per night) and the rest goes to support the AAC.

Weather report:

General rule if the weather looks to be rainy during the night we will just cancel for that night and start the party the next day. I will make the go/no-go decision for Thursday by Wednesday night.

Note:

The Zombie party got its name from the way we all look the next morning after staying awake all night observing and has nothing to do with the undead that are occasionally rumored to walk the area! 😊



Upcoming DSO Dates and Locations

These are the dates for the next few AAC Dark Sky Observing (DSO) events. All of these events are scheduled to be at Grier's Field at the Deerlick Astronomy Village: Zombie Party has been rescheduled for May 14-17 at DAV, June 20, July 18, Aug 15. DSOs will usually be on the weekend closest to new moon. The locations and dates of the DSOs may change - check the AAC web page for any updates.

Bradley Observatory Open Houses

Open House Lecture Series for the 2014-2015 school year. The lectures are generally on the second Friday of each month (no open house in January) and run from 8:00PM to 9:00PM. They are followed by viewing with the Observatory's 30-inch Beck Telescope and smaller telescopes (weather permitting). For updates or possible changes to the schedule of lectures see: <http://www.agnesscott.edu/bradleyobservatory/open-house-series.html> **May 15:** Cassini Mission - Carol Paty (Ga Tech). This will be the final open house until the fall semester.

The Next Charlie Elliott Meeting

Join us for our next meeting at 6:30 p.m., Saturday, May 16th, 2015 at the Charlie Elliott Conference Center, Room B. Check <http://ceastronomy.org/blog/home> for the latest information and updates about the meeting.

Meeting Agenda

Astronomy, History, and Mythology!

Join us May 16th, 2015 at 6:30 p.m. for an engaging and informative discussion on astronomy and mythology given by one of the Charlie Elliott Astronomy founders, Phil Sacco. Those who have been to any of Phil's presentations know that he is a highly sought after, dynamic, and engaging speaker. When I met Phil, I was attending my first Charlie Elliott Astronomy meeting and setting up my telescope while answering questions from a group of inquisitive youngsters. Even though the sun hadn't set and there was nothing to see yet, they wanted to look in the eyepiece, so I asked Phil if I could borrow his step stool. Phil kindly obliged and we've been friends ever since. That night, on what we now call Jon Wood Astronomy Field, Phil gave an impromptu "Walk-and-Talk" to a group of 30 captivated visitors about the visible constellations. Not only did we learn where these constellations were in the sky, we learned their significance in cultures that existed many centuries past. For our May meeting, Phil will reprise his impromptu field presentation and discuss the mythology, history, and cultural significance of the constellations you'll see in the May night sky. Prepare to be informed and entertained!

After a renewed childhood interest in Astronomy, Phil went on to become an officer of the Atlanta Astronomy Club, serving as President, Vice President, and Observing Supervisor. Phil also served on a national scale as the Southeast Regional Director of the Astronomical League. Today, Phil is the eleventh person to earn the title of Master Observer, one given to those individuals who complete 10 Astronomical League observing programs. There are currently 160 Master Observers in the United States.

Phil isn't a Georgia native, but got here as fast he could. Born in New York at a very young age, Phil moved to Georgia as a young boy, eventually earning degrees at Augusta University and Medical College of Georgia, School of Dentistry, graduating summa cum laude. When not talking about or observing the night sky, Phil enjoys making mead using a 2000 year old Roman recipe and performing as a magician.

What's Up! - Charlie Elliott Astronomy Observing Supervisor John Towne will be giving a short presentation of what you can expect to see in the sky this month with binoculars and small telescopes as well as the monthly Charlie Elliott Observing Challenge. At the meeting, remember to ask John for the target list and SkyMap! The target list and presentation from the last meeting are available for download at the CE Chapter web page.

Sunset Time Alert - While we would love for everyone to stay for the entire meeting, we realize that some folks prefer to leave a bit earlier so as to set up their equipment at the observing field before dark. If the meeting runs longer than planned, a "Sunset Time Alert" will be announced.

"Observing after the Meeting" - All are invited to Jon Wood Astronomy Field immediately after the meeting (weather-permitting). You don't have to be a member to attend the meeting or join us on Jon Wood Astronomy Field with your telescope (or just your eyeballs). Note: The security gate at the entrance to the main road leading up to the observing field closes at 10:00 p.m. You'll be able to leave at any time, but you won't be able to get in after 10:00 p.m. You will, however, be able to park near the gate and walk a few hundred feet to the observing field after 10:00 p.m.

Place: Jon Wood Astronomy Field at Charlie Elliott Wildlife Center.

April Charlie Elliott Chapter Meeting

April 18, 2015

By Van Macatee, Chapter Secretary

The April meeting conveyed at 5:00 PM EDT at the Charlie Elliott Wildlife Center. Thirty-four members and guests were in attendance.



Steve Siedentop, Chapter Director, opened the meeting and announced the Board is proposing changes to the clubs By-laws as follows:

- * Clarify the roles of Club elected Officers.
- * Adding a new position to oversee the clubs Facilities and equipment.
- * Adoption of an annual operating planning process and budget.
- * Overhaul of the chapters Outreach program to better balance our commitments with volunteer capacity to support.

Steve invited all members to get involved and propose changes to the by-laws for consideration by the board.

Proposed By-laws will be finalized and communicated to chapter membership within the next 2 weeks for consideration. The new by-laws will be submitted for membership approval at the May club meeting.

Steve also reminded attendees that annual officer elections will occur at the May meeting and asked for nominations to be submitted to Steve. He also announced the existing officers have volunteered to serve another year.

Steve then reminded attendees that CE officials have elected to install a locked gate at the entrance to the observing field. The code to the lock will be provided to all paying members.

Lastly, Steve reminded that it is time to renew dues and urged all members to do so as soon as possible. An updated membership roster will be placed on the clubs web site before the May meeting.

John Towne, Observing Supervisor, delivered the "What's Up" presentation featuring the Constellation Virgo. John's image of the Pleiades was featured as our image of the month. John's presentation is available on the club's website.

Up next was Jack Fitzmier, Chapter Astronomy League coordinator who presented AL observing awards to (photos next page):

Dan Thoman - Basic Level Outreach

David Whalen - Basic and Stellar Level Outreach

Marie Lott - Binocular Messier Program

Continued on next page



Congrats to all for their accomplishments and hard work!

The meetings keynote speaker was club member Tim Geib who delivered an informative and wide ranging talk on astrophotography (photo bottom) including discussion of equipment, data collection (taking pictures) and post processing techniques to extract all the detail possible from the final image. His presentation is on the clubs website.



Unfortunately, our string of cloudy nights and bad weather precluded observing on Jon Wood Astronomy Field.

The next meeting will take place on May 16th at 6:30 pm.

Deerlick Astronomy Village Memorial Weekend Picnic

It's time for the annual picnic at Deerlick Astronomy Village! Please join us in the pavilion on Grier's Field on Sunday, May 24th, 2015 at 5 PM for a great potluck meal. Picnic guests may enjoy free camping under the stars on Sunday evening. AAC members should be sure to check out our clubhouse & observatory on the field! This event is open to anyone interested in stargazing under dark skies at DAV.

Time: Grilling, socializing & set up will start at 4 PM. We hope to chow down about 5 PM. There will be an Open House from 7:30-8:30 PM after the picnic so that guests may tour some of the personal observatories before dark.

Where: The picnic will be held at the DAV pavilion on Grier's Field, Deerlick Astronomy Village, near Sharon, GA, located at the end of Aaron Grier Road SE 30631. Driving directions are available online at <http://www.deerlickgroup.com/PDF/DeerlickMap1.pdf>. You can also find Grier's Field on Google Maps at <http://bit.ly/DAVmap>.

Potluck RSVP: Please sign up for the picnic at <http://bit.ly/DAVpicnicRSVP>. The Deerlick Astronomy Village LOA will prepare fresh-grilled hamburgers for all who sign up by the Thursday before the picnic.

Camping: If guests would like to camp on Grier's Field during the weekend, camping after the picnic on Sunday night is free. There will be a \$5 camping fee per person per night for those who would like to come early & camp on Friday &/or Saturday night. A full bath house is located on site. Dark Sky Rules will apply while camping at DAV (see guidelines below). Campers will be asked to sign a personal liability waiver & dark sky rules agreement form. No DAV or AAC membership is required for camping this weekend.

Dark Sky Rules and camping guidelines are available at <http://www.deerlickgroup.com/PDF/DeerlickAstronomyVillageDarkSkyCamping.pdf>

Please contact Marie at DAVpicnic@yahoo.com if you have any questions or if you would prefer to RSVP via email.



The AAC field at the DAV during the 2013 PSSG. The pavilion where the picnic will be held is visible in the background. - Photo by Tom Faber.



Countdown to Pluto

Encounter - 2 Months

The PI's Perspective - Capstone: 2015

By Alan Stern, New Horizons Principle Investigator, April 13, 2015

New Horizons remains healthy and on course for its prime Pluto system science in July!

On July 14, New Horizons will make its closest approach to Pluto and its system of moons. In a cosmic coincidence, that will occur 50 years to the day after the historic first flyby of Mars, on July 14, 1965!

It's amazing – in less than one human lifetime, from innermost Mercury to outermost Pluto – all nine classical planets of our solar system will have been explored. Equally amazing, NASA spacecraft have led the way: from the very first such flyby of Venus in 1962, to the New Horizons flyby of Pluto in 2015, NASA has been first to every one of those planets.

Carl Sagan used to say that there would only be one or two generations of humans who would share that special moment in time, who as children know the planets only as points of light but as adults know them all as places, imaged and studied – real worlds that have become part of human experience.

I am proud that the upcoming exploration of the Pluto system in July will be the very capstone to that historic era of exploration, completing the initial reconnaissance of the planets. And I am happy that you will be a part of that capstone moment.

Just last week the mission began what we call Approach Phase 2. Approach Phase 1, which began in January, was primarily designed to obtain navigation images to home in on Pluto, and data on the space environment where Pluto orbits. Approach Phase 1 concluded April 4, having been performed flawlessly. It included intensive imaging of Pluto and satellites Nix and Charon as dots in the distance to measure their positions against star fields to refine our navigation to Pluto, and the collection of space plasma and dust data to characterize the environment near Pluto.

Approach Phase 2 (AP2), which will last until mid-June, is different. Although we will continue to collect navigation data to home in on Pluto, and environmental data about the space around Pluto, we now turn our

attention to the study of the Pluto system itself. During the next two months, we'll be collecting higher and higher resolution imagery, including both black-and-white and color images, as well as infrared and ultraviolet spectra to learn new things about the composition of Pluto and its moons. In fact, our highest-resolution imager, LORRI, will begin returning images better than any obtained from Earth or Earth-orbit by mid-May – that's next month! By the end of AP2, these images will have about 10 times as many pixels on Pluto as the best images available today.

Other key events in AP2 include a major test of our radio science experiment, REX, which will probe Pluto's atmosphere and measure its temperature and radar reflectivity in July, and possibly two engine burns to trim our trajectory as we navigate toward our precise aim point near Pluto. Also in AP2, the mission team will participate in our last two mission simulations: one for hazard avoidance and one for science data processing. And the science team will meet in late May to finalize its plans for approach and encounter.

As the pace of events heats up you'll be seeing more in the way of image and news releases, so stay tuned. In fact, on the afternoon of April 14, NASA will hold a pair of televised events including our team and NASA leadership, so press and public can learn more about our detailed objectives and flyby plans for the exploration of Pluto and its moons. This event will be available live on the Web at www.nasa.gov, and anyone can tune in!

By the time I next write, in May, we'll be deep in Approach Phase 2 and on the verge of the fast-paced, historic events of June and July that will reveal Pluto and its moons "for all mankind."

Well, that's it for now. Until I write again, I hope you'll keep exploring – just as we do.



First Pluto-Charon Color Image from New Horizons

Release Date: April 14, 2015

This image of Pluto and its largest moon, Charon, was taken by the Ralph color imager aboard NASA's New Horizons spacecraft on April 9 and downlinked to Earth the following day. It is the first color image ever made of the Pluto system by a spacecraft on approach. The image is a preliminary reconstruction, which will be refined later by the New Horizons science team. Clearly visible are both Pluto and the Texas-sized Charon. The image was made from a distance of about 71 million miles (115 million kilometers)-roughly the distance from the Sun to Venus. At this distance, neither Pluto nor Charon is well resolved by the color imager, but their distinctly different appearances can be seen. As New Horizons approaches its flyby of Pluto on July 14, it will deliver color images that eventually show surface features as small as a few miles across.

Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute



Jupiter By Dan Llewellyn

Jupiter with Io (near center) and Ganymede (right edge) transiting. Photo taken during the 2013 Peach State Star Gaze.



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 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 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/atlastro>.

AAC Officers and Contacts

President: Mark Banks President@AtlantaAstronomy.org

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PSSG Co-Chair: Open

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Woodruff Observ. Coordinator: Sharon Carruthers
Treasurer@AtlantaAstronomy.org

AAC Webmaster: Daniel Herron
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Calendar by Tom Faber (Times EDT/EST unless noted)

AAC Events are listed in BOLD

- May 5th, Tuesday: Full Moon. Eta Aquarid Meteor Shower.
- May 7th, Thursday: Mercury at Greatest Eastern Elongation.
- May 9th, Saturday: **AAC Meeting at Fernbank Science Center 3:00PM.**
- May 11th, Monday: Moon Last Quarter.
- May 16th, Saturday: **CEA Meeting.**
- May 19th, Tuesday: New Moon.
- May 21st, Wednesday: Moon near Venus.
- May 23rd, Saturday: Saturn at Opposition.
- May 25th, Monday: Moon First Quarter.
- May 30th, Saturday: Mercury at Inferior Conjunction.
- June 1st, Monday: Venus near Pollux & Castor.
- June 2nd, Tuesday: Full Moon.
- June 6th, Saturday: Venus at Greatest Eastern Elongation.
- June 9th, Tuesday: Moon Last Quarter.
- June 12th, Friday: Venus near Beehive.
- June 13th, Saturday: **AAC Meeting at Fernbank Science Center 3:00PM**
- June 14th, Sunday: Mars conjunction with Sun.
- June 16th, Tuesday: New Moon.
- June 20th, Saturday: **CEA Meeting.** Grouping of Moon, Venus, & Jupiter.
- June 21st, Sunday: Summer Solstice at 12:38PM.
- June 24th, Wednesday: Moon First Quarter. Mercury at Greatest Western Elongation.
- June 28th, Sunday: Moon near Saturn.
- June 30th, Tuesday: Venus & Jupiter only 1/3 degree apart!!
- July 1st, Wednesday: Full Moon.

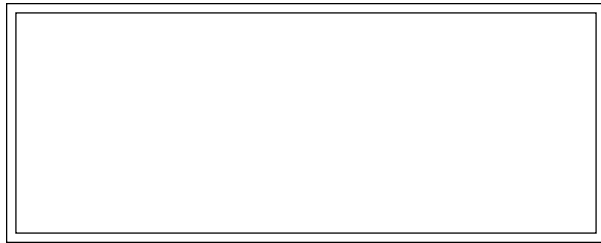
For more event listings see the calendar at www.atlantaastronomy.org

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 June is Saturday, May 23. Submissions after the deadline will go in the following issue.**



FIRST CLASS



www.beclage.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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