

The Focal Point

The Atlanta Astronomy Club
Established 1947
April 2018

Vol. 30 No. 8

Editor: Tom Faber

Table of Contents

- Page 1...** April AAC Mtg, 2018 Zombie Star Party
Page 2... March AAC Meeting Report
Page 3... March AAC Meeting Report, Next CEA Meeting
Page 4... CEA March Mtg, Hubble Measures Distance to Globular
Page 5... Images by Dan Llewellyn
Page 6... "Hubble Uncovers the Farthest Star Seen"
Page 7... Oddball Galaxy, AAC Online, Memberships, Contact Info
Page 8... Calendar, AAC List Serv Info, Focal Point Deadline

The April AAC Meeting

*** Note Location Change ***

In place of the regular meeting the Atlanta Astronomy Club will be working with the Tellus Science Museum in Cartersville for Astronomy Day on Saturday, April 21. Tellus opens at 10AM and its observatory will open starting at 1PM for solar viewing. Members of the AAC will also have scopes set up for solar view. In the evening we will have scopes set up of night viewing and the Tellus observatory will be open until 11PM. At 2PM AAC member Daniel Herron will present a talk about his trip to Wyoming last August for the solar eclipse for the guests at Tellus. For more information about the events at Tellus see:

<http://tellusmuseum.org/museum-events/astronomy-day/>



The AAC table at the 2016 Tellus Astronomy Day event.

Photo by Tom Faber.

2018 Zombie Star Party

The 2018 Zombie Star Party will be at the Deerlick Astronomy Village on the nights of April 12,13,and 14th. The Zombie Star Party is:

A no frills, three night, mini star party.

A nice introduction to star parties for beginners.

Held At the DeerLick Astronomy Village (DAV) near Crawfordville, Ga, one of the darkest locations within a 2-hour drive from Atlanta (mag 6 – 6.5 skies).

DAV has plenty of camping, showers & flush toilets, electricity, wifi & a large picnic shelter.

Camping fee is \$10 a night. Open to all, No registration pay upon arrival.

For more information contact the AAC observing chair Daniel Herron at Observing@AtlantaAstronomy.org

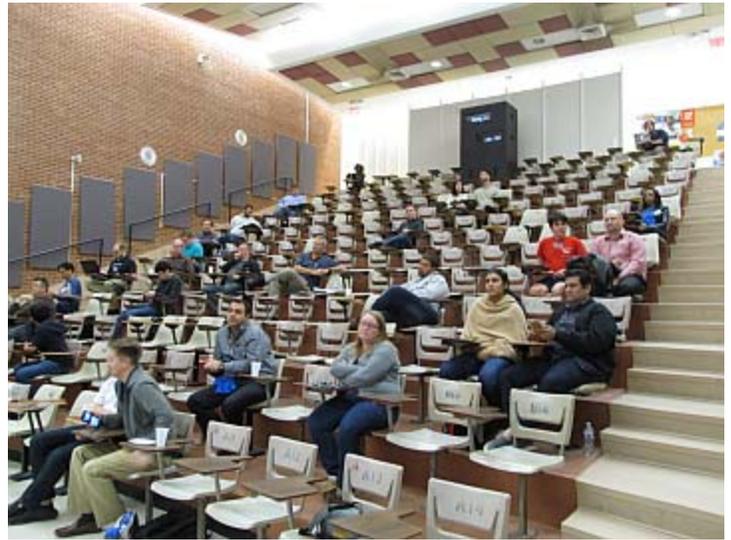


The field at the DAV during the 2013 PSSG - Photo by Tom Faber.

March AAC Meeting Report

Meeting photos by Tom Faber

The March meeting of the Atlanta Astronomy Club was held on Thursday, March 15th beginning at 7:30PM, at the Howey Physics Building on the Georgia Tech campus. The meeting held in conjunction with the Georgia Tech community, and Northrup Grumman Corporation. Several Northrup Grumman people were on hand including David Fluker (photo right middle, on the left), and joining us by teleconference was Northrop Grumman engineer Martin (Marty) Fredrick for the Q&A portion of the program. The program was a presentation about the James Webb Space Telescope. For the first part of the meeting we watched a video titled *Into the Unknown: The James Webb Space Telescope* (<http://www.northropgrumman.com/CorporateResponsibility/CorporateCitizenship/Education/IntoTheUnknown/Pages/default.aspx>) about the design development of the next generation space telescope. After we viewed this 40 minute video there was a panel discussion about the James Webb Space Telescope and the astronomical observations it will conduct. The Q&A session lasted close to one hour.



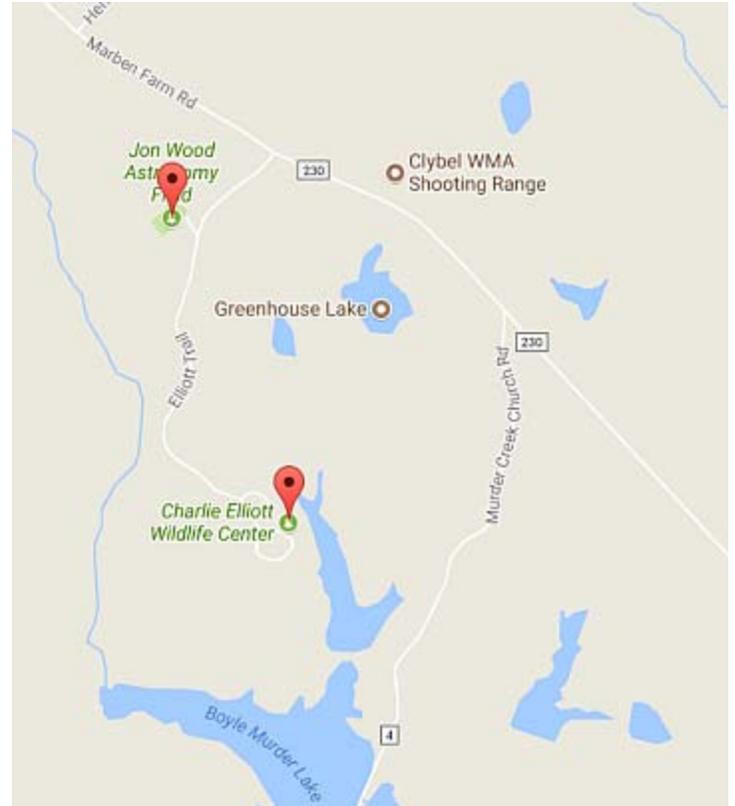


The Next Charlie Elliott Meeting

Join us on Saturday, April 14th, 2018 at 6 p.m. at the Charlie Elliott Conference Center, Room B, for an informative and engaging discussion with Georgia State University PhD Candidate Sushant Mahajan covering heliophysics and space weather! Yes, space weather is a thing.

You may have heard about the supposed impending ice age and the connection to the alleged cooling of the sun over the next few decades. While that makes good filler for a slow news day, the truth about what actually happens on our nearest star is orders of magnitude more amazing and interesting than anything a Russian troll factory can post on Facebook that your brother-in-law's cousin's neighbor's daughter's interim assistant soccer coach will share in your "news" feed.

Sushant hails from Maharashtra, a state in west India, home to the city of Mumbai, and the galactic center of the Bollywood film industry. Sushant



Credit: Google Maps

earned his Master of Technology in Engineering Physics from the Indian Institute of Technology in 2014, then earned his Master of Science in Physics from Georgia State University in 2017, and is currently an Astronomy PhD candidate at Georgia State University where the focus of his research is on our nearest star, including heliophysics, solar dynamo theory, space weather, and helioseismology. You can find out more about Sushant and his research [here](#).

Friendly reminder: If you haven't paid your yearly dues, now is the time! Your dues go towards supporting our community outreach efforts and to maintain the facilities on Jon Wood Astronomy Field. It's quick and it's easy...[click here](#).

All of the Above!

David Whalen, Charlie Elliott Astronomy Observing Supervisor will give a 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. If you've been to one of our meetings, you know that David is a

Continued on next page



dynamic and engaging speaker and always delivers a lot of great information with plenty of laughs! Be sure to ask for the monthly target list and a SkyMap! David will be joined by Astrophotography Coordinator Mark Woolridge who will cover the imaging challenges of the month and tips on how to image them.

Observing After the Meeting

All are invited to Jon Wood Astronomy Field immediately after the meeting for observing (weather-permitting).

Tech Talks

Tech Talk details are still forming. If you have an idea for a 15-30 minute discussion or presentation that you would like to see or would like to give, contact the Charlie Elliott Program Coordinator, Steve Sidentop - program@ceastronomy.org.

Our Monthly Meetings and Public Observing Nights for 2018

Future Charlie Elliott meetings will be held on: April 14, May 12, June 16, July 14, August 11, September 8, October 6, November 10, December 8, 2018. Meetings start approximately 2 hours before sunset. Meeting rooms and start times vary, so please check back for updates or changes at: <http://ceastronomy.org/blog/home>

The March Charlie Elliott Meeting

Stephanie Dickson, Secretary, Charlie Elliott Chapter

Meeting Minutes: 3/17/18

Attendees: Meeting - 30, Field - 25

Dinner: 4:30pm by Mike Shaw, Meeting time: 5:30pm

Meeting called to order by Mike Shaw

Outreach by Mike Shaw:

- 3/22 7th Kite Science
- 3/26 Grayson Elem 6-8pm
- 4/7 Old Buckhead Days & Sun over Anna Ruby Falls 11-3
- 4/23 Bay Creek Middle School
- 4/26 Boyscout 8:30-10:30pm Charlie Elliott
- 4/28 Madison Township
- 4/12-4/14 Zombie Party

Other news:

Welcome new members/guests - Mike Shaw

March Renewals - Mike Shaw

Stephen Hawking Passing

Ken Poshedly:

ALPO updates, Annual Conference in CA

Steve Sidentop:

Voting booths (table) for sell \$40 with red light and case

Next meeting GA State PhD candidate on Binary Stars

Fernbank needs help with cleaning mounts and refurbishing scopes

Maria Zorka:

3 child shirts (child XL)

David gave his presentation on "All of the Above":

Vernal Equinox - March 20th, Spring means galaxy season, Lose 2.07 minutes each night of darkness, Scott Kelly 7% gene changed from being on ISS, China's Tiangong 1 space lab fallback to Earth 3/30-4/9, March 31st blue moon (2nd of 2018), March 17th new moon, Magical month of Mars, Constellation updates.

March 2018 Target List: Relaxing, Intriguing, Taxing Challenge - Antennae Galaxies NCG 4038/4039

Next Meeting 4/14/18

Voting on new board during May meeting

AP Targets by Mark Woolridge: March-April

Beginner Target List - Zodiacal Lights, Intermediate Target - Leo Trio (M65, 66, NCG3628), Narrowband Target - N/A, Advanced Target - Hamburger Galaxy

Meeting Ended: 6:24pm Mike Shaw

Hubble Makes the First Precise Distance Measurement to an Ancient Globular Star Cluster

NASA/STScI News Release - Apr 4, 2018

Astronomers using NASA's Hubble Space Telescope have for the first time precisely measured the distance to one of the oldest objects in the universe, a collection of stars born shortly after the big bang.

This new, refined distance yardstick provides an independent estimate for the age of the universe. The new measurement also will help astronomers improve models of stellar evolution. Star clusters are the key ingredient in stellar models because the stars in each grouping are at the same distance, have the same age, and have the same chemical composition. They therefore constitute a single stellar population to study.

This stellar assembly, a globular star cluster called NGC 6397, is one of the closest such clusters to Earth. The new measurement sets the cluster's distance at 7,800 light-years away, with just a 3 percent margin of error.

Until now, astronomers have estimated the distances to our galaxy's globular clusters by comparing the luminosities and colors of stars to theoretical models, and to the luminosities and colors of similar stars in the solar neighborhood. But the accuracy of these estimates varies, with uncertainties hovering between 10 percent and 20 percent.

However, the new measurement uses straightforward trigonometry, the same method used by surveyors, and as old as ancient Greek science. Using a novel observational technique to measure extraordinarily tiny angles on the sky, astronomers managed to stretch Hubble's yardstick outside of the disk of our Milky Way galaxy.

For the full story: http://hubblesite.org/news_release/news/2018-24

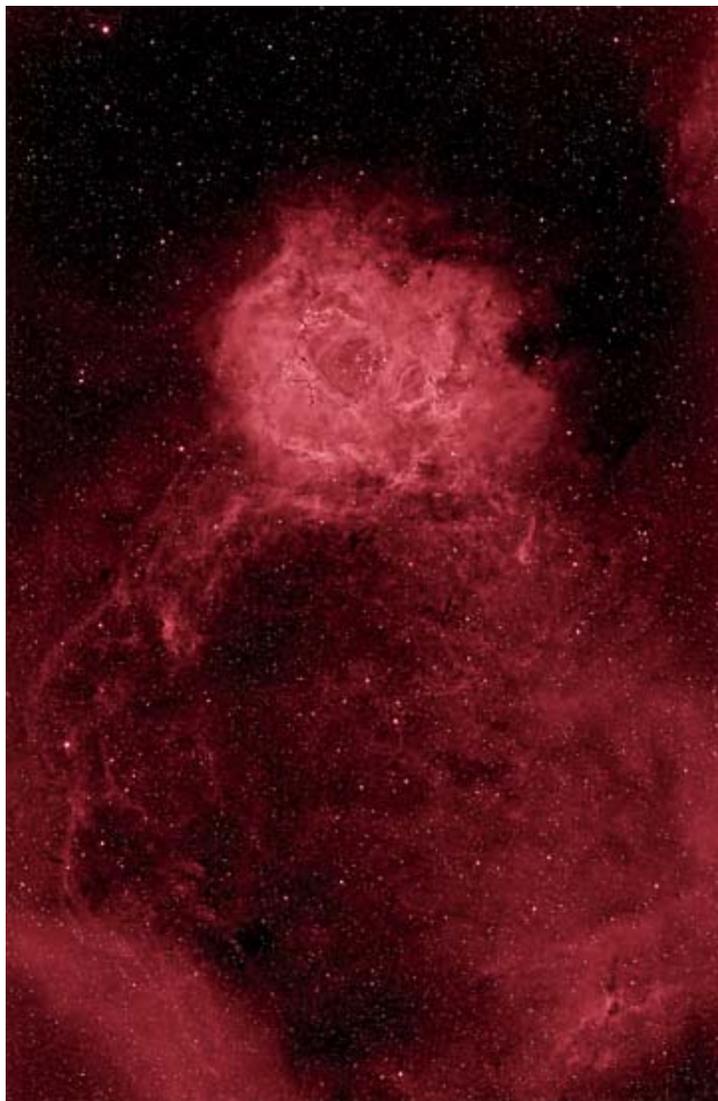


Credit: NASA, ESA, and T. Brown and S. Casertano (STScI)

Acknowledgement: NASA, ESA, and J. Anderson (STScI)

Images by Dan Llewellyn

Dan Llewellyn recently captured these images at the Deerlick Astronomy Village near Sharon, GA.



Wide field image of the Rosette Nebula (NGC 2244) with Stem

Image Details:

Telescope - William Optic Star 71, f4.9 (version 1).

Mount - Paramount MX polar aligned with PoleMaster

Filter - Baader 3.5nm Hydrogen Alpha

Camera - Sony A7s modified and cooled.

Exposure - 3 at 10 minutes each, ISO 5,000

Processing - stacked 8 bit jpegs, bad pixel map subtraction only, no bias or flats.



The Flaming Star Nebula (IC 405)

Image Details:

Telescope - William Optic Star 71, f4.9 (version 1).

Mount - Paramount MX polar aligned with PoleMaster

Filter - Baader 3.5nm Hydrogen Alpha

Camera - Sony A7s modified and cooled.

Exposure - 5 at 10 minutes each, ISO 5,000

Processing - stacked 8 bit jpegs, bad pixel map subtraction only, no bias or flats. Mono version, as well as mono converted to red.

Hubble Uncovers the Farthest Star Seen

NASA/STScI News Release - Apr 2, 2018

More than halfway across the universe, an enormous blue star nicknamed Icarus is the farthest individual star ever seen. Normally, it would be much too faint to view, even with the world's largest telescopes. But through a quirk of nature that tremendously amplifies the star's feeble glow, astronomers using NASA's Hubble Space Telescope were able to pinpoint this faraway star and set a new distance record. They also used Icarus to test one theory of dark matter, and to probe the make-up of a foreground galaxy cluster.

The star, harbored in a very distant spiral galaxy, is so far away that its light has taken 9 billion years to reach Earth. It appears to us as it did when the universe was about 30 percent of its current age.

The discovery of Icarus through gravitational lensing has initiated a new way for astronomers to study individual stars in distant galaxies. These observations provide a rare, detailed look at how stars evolve, especially the most luminous stars.

"This is the first time we're seeing a magnified, individual star," explained former University of California at Berkeley postdoc and study leader Patrick Kelly now of the University of Minnesota, Twin Cities. "You can see individual galaxies out there, but this star is at least 100 times farther away than the next individual star we can study, except for supernova explosions."

Gravity as a Natural Cosmic Lens

The cosmic quirk that makes this star visible is a phenomenon called "gravitational lensing." Gravity from a foreground, massive cluster of galaxies acts as a natural lens in space, bending and amplifying light. Sometimes light from a single background object appears as multiple images. The light can be highly magnified, making extremely faint and distant objects bright enough to see.

In the case of Icarus, a natural "magnifying glass" is created by a galaxy cluster called MACS J1149+2223. Located about 5 billion light-years from Earth, this massive cluster of galaxies sits between the Earth and the galaxy that contains the distant star. By combining the strength of this gravitational lens with Hubble's exquisite resolution and sensitivity, astronomers can see and study Icarus.

The team — including Jose Diego of the Instituto de Física de Cantabria, Spain, and Steven Rodney of the University of South Carolina, Columbia — dubbed the star "Icarus," after the Greek mythological character who flew too near the Sun on wings of feathers and wax that melted. (Its official name is MACS J1149+2223 Lensed Star 1.) Much like Icarus, the background star had only fleeting glory as seen from Earth: It momentarily skyrocketed to 2,000 times its true brightness when temporarily magnified.

Models suggest that the tremendous brightening was probably from the gravitational amplification of a star, similar in mass to the Sun, in the foreground galaxy cluster when the star moved in front of Icarus. The star's light is usually magnified by about 600 times due to the foreground cluster's mass.

Characterizing Icarus

The team had been using Hubble to monitor a supernova in the far-distant spiral galaxy when, in 2016, they spotted a new point of light not far from the magnified supernova. From the position of the new source, they inferred that it should be much more highly magnified than the supernova.

When they analyzed the colors of the light coming from this object, they discovered it was a blue supergiant star. This type of star is much larger, more massive, hotter, and possibly hundreds of thousands of times intrinsically brighter than our Sun. But at this distance, it would still be too far away to see without the amplification of gravitational lensing, even for Hubble.

How did Kelly and his team know Icarus was not another supernova? "The source isn't getting hotter; it's not exploding. The light is just being magnified," said Kelly. "And that's what you expect from gravitational lensing."

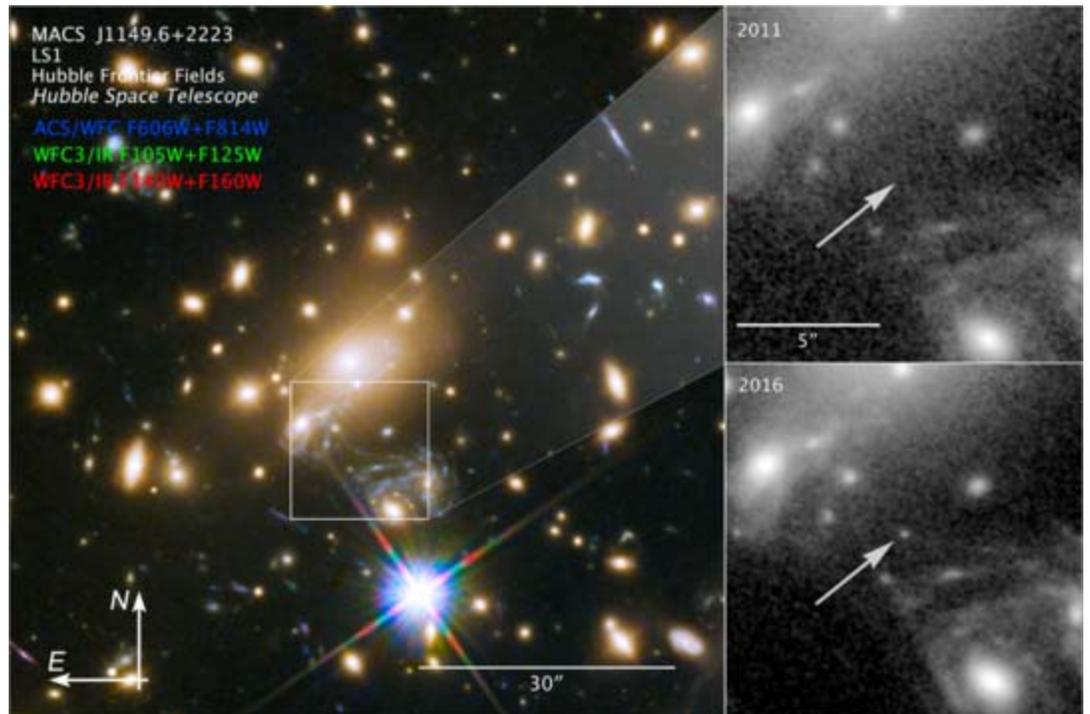
Looking for Dark Matter

Detecting the amplification of a single, pinpoint background star provided a unique opportunity to test the nature of dark matter in the cluster. Dark matter is an invisible material that makes up most of the universe's mass.

By probing what's floating around in the foreground cluster, scientists were able to test one theory that dark matter might be made up mostly of a huge number of primordial black holes formed in the birth of the universe with masses tens of times larger than the Sun. The results of this unique test disfavor that hypothesis, because light fluctuations from the back-

Through a quirk of nature called "gravitational lensing," a natural lens in space amplified a very distant star's light. Astronomers using Hubble took advantage of this phenomenon to pinpoint the faraway star and set a new distance record for the farthest individual star ever seen. They also used the distant star to test one theory of dark matter, and to probe the make-up of a galaxy cluster. The team dubbed the star "Icarus," after the Greek mythological character who flew too near the Sun on wings of feathers and wax that melted. Its official name is MACS J1149+2223 Lensed Star 1.

NASA, ESA, and P. Kelly (University of Minnesota)



ground star, monitored with Hubble for 13 years, would have looked different if there were a swarm of intervening black holes.

When NASA's James Webb Space Telescope is launched, astronomers expect to find many more stars like Icarus. Webb's extraordinary sensitivity will allow measurement of even more details, including whether these distant stars are rotating. Such magnified stars may even be found to be fairly common.

The Hubble Space Telescope is a project of international cooperation between NASA and ESA. NASA's Goddard Space Flight Center in Greenbelt, Maryland, manages the telescope. The Space Telescope Science Institute (STScI) in Baltimore, Maryland, conducts Hubble science operations. STScI is operated for NASA by the Association of Universities for Research in Astronomy, in Washington, D.C.



Dark Matter Goes Missing in Oddball Galaxy

NASA/STScI News Release - Mar 28, 2018

Called NGC 1052-DF2, this "ghostly" galaxy contains at most 1/400th the amount of dark matter that astronomers had expected. How it formed is a complete mystery. The galactic oddball is as large as our Milky Way, but the galaxy had escaped attention because it contains only 1/200th the number of stars as our galaxy.

Based on the colors of its globular clusters, NGC 1052-DF2 is about 10 billion years old. It resides about 65 million light-years away.

Credits: NASA, ESA, and P. van Dokkum (Yale University)

For the full story: http://hubblesite.org/news_release/news/2018-16

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: Dave Lumpkin President@AtlantaAstronomy.org

Program Chair: Open Programs@AtlantaAstronomy.org

Observing Chair: Daniel Herron Observing@AtlantaAstronomy.org

Corresponding Secretary: Tom Faber
Focalpoint@AtlantaAstronomy.org

Treasurer: Sharon Carruthers Treasurer@AtlantaAstronomy.org

Recording Secretary: Lilli Lindbeck,
Secretary@AtlantaAstronomy.org

Board Chair: Sharon Carruthers Treasurer@AtlantaAstronomy.org

Board: Brigitte Fessele, bhfessele1@gmail.com

Board: Open

Board: Steve Phillips sandsphillips@att.net

ALCor: Ken Olson, keneolson@yahoo.com

Elliott Chapter Director: Mike Shaw director@ceastronomy.org

Elliott Observing Chair: David Whalen
observing@ceastronomy.org

Elliott Recording Secretary: Stephanie Dickson
secretary@ceastronomy.org

Elliott Astrophotography Coordinator: Mark Wolridge

Elliott Chapter ALCor: Jack Fitzmier

Elliott Coordinator: Lacy Mitchell, Lacy.Mitchell@dnr.ga.gov

Elliott Webmaster: Larry Owens webmaster@CEastronomy.org

Elliott Outreach Coordinator: Dan Thoman
outreach@ceastronomy.org

Georgia Astronomy in State Parks: Sharon Carruthers
Treasurer@AtlantaAstronomy.org

PSSG Chairman: Peter Macumber pmacumber@nightsky.org

PSSG Co-Chair: Open

Sidewalk Astronomy: Open
sidewalkastronomy@AtlantaAstronomy.org

Light Trespass: Ken Edwards, Contact info TBA

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

AAC Webmaster: Daniel Herron
Observing@AtlantaAstronomy.org

Calendar by Tom Faber (Times EDT/EST unless noted)

AAC Events are listed in BOLD

- Apr 1st, Sunday: Mercury at Inferior Conjunction.
- Apr 2nd, Monday: Mars near Saturn morning.
- Apr 7th, Saturday: Grouping of moon, Mars, and Saturn morning.
- Apr 8th, Sunday: Moon Last Quarter.
- Apr 12th, Thursday: **AAC Zombie Party at DAV Begins.**
- Apr 14th, Saturday: **CEA Chapter Meeting.**
- Apr 15th, Sunday: **AAC Zombie Party at DAV Ends.** New Moon.
- Apr 17th, Tuesday: Moon near Venus evening.
- Apr 18th, Wednesday: Moon in Hyades evening. Uranus conjunction with Sun.
- Apr 21st, Saturday: **Astronomy Day and AAC Meeting at Telus Science Museum.**
- Apr 22nd, Sunday: Lyrid Meteor Shower peaks morning. Moon First Quarter.
- Apr 29th, Sunday: Full Moon. Mercury at greatest western elongation.
- May 7th, Monday: Moon Last Quarter.
- May 8th, Tuesday: Jupiter at Opposition.
- May 12th, Saturday: **CEA Chapter Meeting.**
- May 15th, Tuesday: New Moon.
- May 18th, Friday: **AAC Meeting** at the Fernbank Science Center.
- May 22nd, Tuesday: Moon First Quarter.
- May 29th, Tuesday: Full Moon.
- June 6th, Wednesday: Moon Last Quarter.
- June 13th, Wednesday: New Moon.
- June 16th, Saturday: **CEA Chapter Meeting.**
- June 20th, Wednesday: Moon First Quarter.
- June 28th, Thursday: Full Moon.

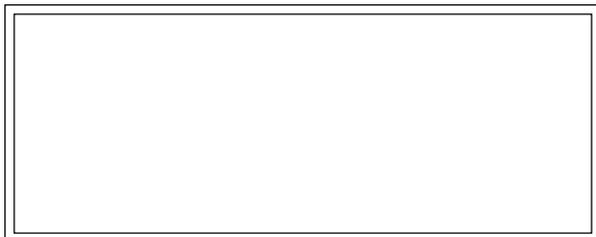
For more event listings and updates see the calendar at www.atlantaastronomy.org

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 with images separate but Word documents or PDFs are okay. **The deadline for May is Saturday, April 28. Submissions received after the deadline will go in the following issue.**



FIRST CLASS



www.betagg.com



Atlanta Astronomy Club
P.O. Box 76155
Atlanta, GA 30358-1155
www.atlantaastronomy.org
On Twitter at <http://twitter.com/atlastro>

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

Newsletter of The Atlanta Astronomy Club, Inc.

The Focal Point

