

The Focal Point

The Atlanta Astronomy Club
Established 1947
March 2017

Vol. 29 No. 10

Editor: Tom Faber

Table of Contents

- Page 1...** March General Meeting
Page 2... Renewals, February Meeting Report and Photos
Page 3... Next CEA Meeting, Zombie Party, AAC at AnachroCon
Page 4... President's Desk, CEA Meeting Report, VR 20" Scope
Page 5... Tom Buchanan's Research Papers
Page 6... Saturn's Hexagon, "The Dawn of a New Era for SN 1987A"
Page 7... AAC Online, Memberships, Contact Info
Page 8... Calendar, AAC List Serv Info, Focal Point Deadline

March AAC General Meeting

Important Note - Location and Time Change!

Please join us for the next general meeting of the Atlanta Astronomy Club, to be held on Saturday, March 18th starting at 7:00 PM. The meeting will be held in Room E208 of Emory University's Math and Science Building, 400 Dowman Dr. Atlanta 30322 (See map).

The Talk

The Atlanta Astronomy Club & The Atlanta Science Festival will be showing a documentary about the development & construction of the James Webb Space Telescope. The James Webb telescope will launch in late 2018 and replace the Hubble Telescope. The documentary is being provided by Northrup Grumman, Prime contractor for the Webb Scope, and will be followed by a panel discussion. Please join us for this very informative & interesting program. Please RSVP at: www.meetup.com/Atlanta-Astronomy-club-meetup

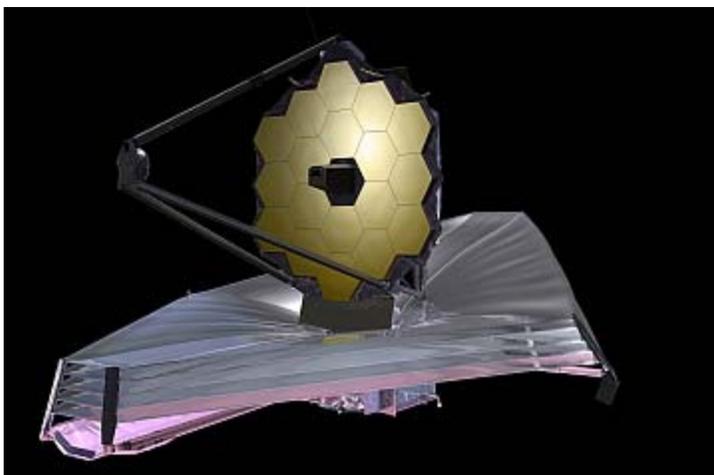
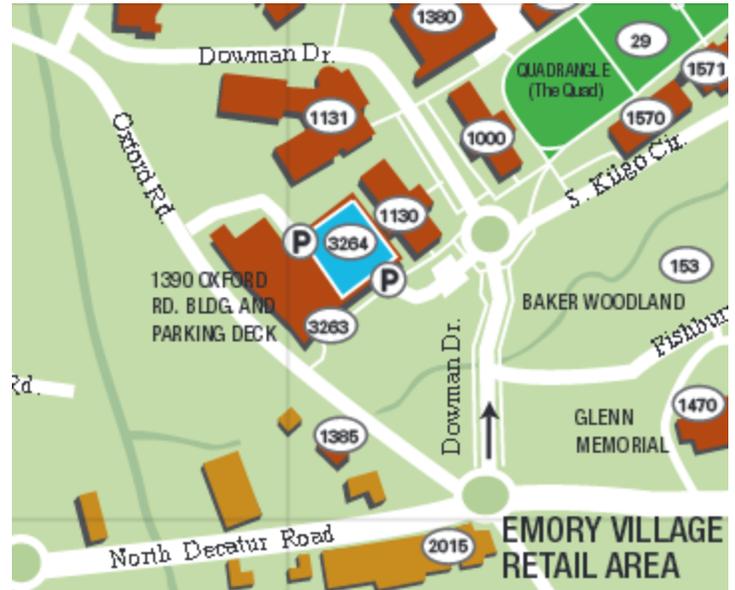


Illustration of the James Webb Space Telescope after deployment. NASA



The Math & Science Building is number 1131. Parking is available in the parking deck off of Oxford Rd.



The JWST optical assembly after its completion in the clean room at NASA Goddard last year. The optical assembly was then integrated with the Science Instrument Module. This assembly will then be shipped to Northrup Grumman to be integrated with the Spacecraft Bus, which will provide electrical power, communications, computing, propulsion, and thermal control. NASA image.

March is 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 2016 by the end of March. Please send your renewals to AAC Treasurer Sharon Carruthers, renew online using PayPal, or you can bring your renewal to the March Meeting. For more information see: http://atlantaastronomy.org/?page_id=22

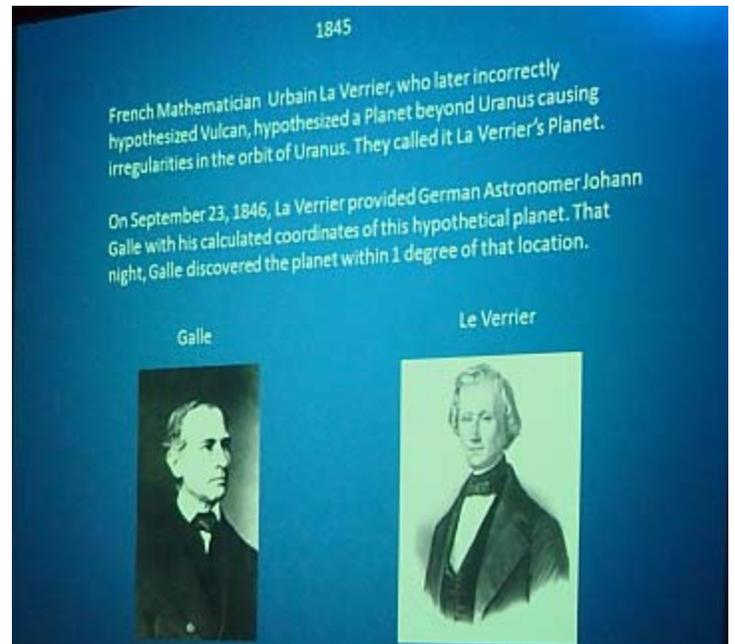
Thank You for your support of the AAC!

February Meeting Report

Photos by Tom Faber unless noted

The February AAC general meeting was held on Saturday, February 18th at the Fernbank Science Center. About 50 members and guests were present. The general meeting began at 3PM. Our featured speaker was long time member of the Atlanta Astronomy Club Phil Danneman. Phil presented a talk about planets - current, former, future, hypothetical, extrasolar and imaginary. Phil talked about how the Solar System grew from its 7 original planets: Mercury, Venus, Mars, Jupiter, Saturn, the sun, and the moon (the moon & the sun were once considered equal to the 5 known planets), to as many as 23 as Uranus, Neptune, and a number of small planets were discovered. The count then dropped to 8 as the small planets were moved into a new category - the asteroids. The number then increased to 9 in 1930 with the discovery of Pluto, then dropped back to 8 as Pluto and Ceres were reclassified as Dwarf Planets. Phil also talked about the growing number of extrasolar planets discovered and some hypothetical solar system planets, such as the planet Vulcan that was once thought to exist inside the orbit of Mercury.

After his talk Phil answered a number of questions. Club officers then announced upcoming AAC events and activities. Afterwards a number of us went to a nearby restaurant for dinner and more conversations.



Photos bottom left and bottom right are by Philip Johnson.

The Next Charlie Elliott Meeting

Meeting Details

Please join us on March 25, 2017 at 3:30 p.m. for our meeting! Details of the meeting and talk are TBA. Check here for updates: <http://ceastronomy.org/blog/home>

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.

Upcoming meetings are on: April 22, May 27, June 24 (potluck), July 22.

The AAC Zombie Party

By Daniel Herron, AAC Observing Chair

This year's Zombie Party is scheduled for Thursday, April 27 thru Sunday, April 30 (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!). The event is \$15 per person per night due upon arrival, no refunds for bad weather once paid. See you there!

Weather:

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!



The AAC at AnachroCon

AnachroCon is a history/alternate history/science fiction/steampunk convention held in Atlanta every February (<http://www.anachrocon.org>). As part of the science track panels organized by Richard Jakiel, members of the Atlanta Astronomy Club set up telescopes for attendees of AnachroCon to view the sun in the daytime and the sky at night. This year David Lumpkin and Ken Olson set up several telescopes for viewing the night sky both Friday and Saturday, and solar scopes on Saturday afternoon. Here are a few photos from the event. Photos by Tom Faber.



From the President's Desk

By Mark Banks, AAC President

Our March meeting will be a special joint event with the Atlanta Science Festival.

Location: Emory Univ. Math & Science building, 400 Dowman Dr. Atlanta 30322 Room E208

Time: 7:00 PM – 9:00 PM

Program: We will view a documentary about the development & construction of the James Webb space telescope. Following that we will have a panel discussion. The panelists will include Webb Team members and several local Astronomy professionals. The Webb telescope will be replacing the aging Hubble telescope. The documentary is being provided by Northrup Grumman, prime contractor for NASA on the Webb project. Please RSVP at: www.meetup.com/Atlanta-Astronomy-club-meetup

Meeting space: We are seeking a new place to have our monthly meeting. We would like to find a place that would enable us to meet in the evening around 7PM and then set up scope for stargazing after the meeting. Anyone who may have any ideas or suggestions about a good place to meet should contact any club officer and let us know.

Elections: Club elections are coming up in May. If you want to run for office or would like to nominate someone please contact any club officer. All positions are available so don't hesitate. The club is what the members make it and you can get involved with the leadership.

The February Charlie Elliott Meeting

By Brian Tucker, Charlie Elliott Chapter Recording Secretary

Meeting Minutes: 2/25/2017

3:00 Barry did a presentation on the Intel Stick PC and Astrophotography prior to the official meeting. Temporary location of meeting recording: <https://drive.google.com/open?id=0B99wtzA-knP9TUkxWWFGdHcyaFU> (I plan to get it downloaded and on Youtube for reference)

Attendees:

Meeting 40, Field 31

David Whalen called the meeting to order at 4:15 PM.

Outreach:

March 3 - 6:30 PM Hightower Elementary School - Indoor and outdoor presentations and observing, April 1 - 11:00 - 3:30 Ana Ruby Falls - Backup date is April 15, April 22 10:00 - 4:00 Madisonfest - Madison Spring Fling - Always give CE a booth - Daytime, April 28 7:00 - 11:00 Sharon Shenanigans - Friday astronomy night (free camping for volunteers, April 29 9:30 - 4:00 Sharon Shenanigans - Set up Solar Telescopes.

Jack Fitsmier: 3 new master observers - they haven't stopped:

Marie Lott: Plot the course of Asteroids - just finished 100 asteroids. To see her work, please check out <http://bit.ly/mariesasteroids>

Ken Poshedly: ALPO - having annual meeting this fall - They wanted presentations of the August 21 Solar Event. They will be meeting October 27-28 at University of Georgia in conjunction with the Georgia Regional Astronomers Group. No registration fee, although the ALPO will be having dinner after the meeting. Venus/Saturn Coordinator would like to do a 10 minute discussion around Venus or Saturn.

Jim Honeycutt donated his 12" dobsonian to the club for club use. Unfortunately, Jim wasn't able to make it tonight due to health reasons.

David gave his presentation on "All of the Above" at 4:30

Dr. Merida Batiste - Georgia State University, Subject: Island Universes - Gravitationally bound Superclusters of galaxies in an Expanding universe.

Disassembly of the VR 20-inch Scope

Work to disassemble the 20-inch reflector at the club's Villa Rica Observatory for its eventual move the AAC's site at the Deerlick Astronomy

Village got underway on Saturday, February 4. Here are some more photos of the work to disassemble the 20-inch telescope at the Villa Rica observatory. Photos by Philip Johnson.

Here the primary mirror and mirror cell have been removed from the tube in preparation for removing the OTA from the fork mount.



Philip Johnson writes: "Much of the remaining steel fork, the azimuth axle/bearing blocks, steel base plate, etc. is welded together. I would guess the weight of what remains bolted to the concrete totals well over 1200 pounds. Would anyone else care to make a guess?"



Philip also sent this photo of some attendees at the 2013 ALPO convention visiting the VR Observatory.

Tom Buchanan's Research Papers

Lifetime AAC member Tom Buchanan has had several papers published about his research. Here are abstracts of and links to his research papers.

A Slitless Spectrographs that Provides Reference Marks

Authors: Buchanan, Tom

Publication: The Society for Astronomical Sciences 35th Annual Symposium on Telescope Science. Published by Society for Astronomical Sciences, 2016, pp.171-184

Publication Date: 05/2016

Origin: AUTHOR

Bibliographic Code: 2016SASS...35..171B

Abstract

The author designed and built a slitless spectrograph to record reference marks along the spectrum of a point light source. Spectra can be taken of transient, clustered, or moving lights when a spectrograph cannot be accurately aimed at the lights to capture slit spectra. Three beams of undispersed light, directed by mirrors and lenses, provide reference marks. Near each end of the spectrum a reference mark barely varies from the corresponding point on the spectrum when the aim toward the light source varies. Within 2 degrees of perfect aim toward the light source, the variation is less than 7 angstroms. The third reference mark enables this variation to be quantified. The locations and orientations of the optical components are mathematically derived. Additional features of the spectrograph enable the use of a slit and comparison spectrum, and the recording of higher orders by moving the camera and using specific Wratten filters.

<http://adsabs.harvard.edu/abs/2016SASS...35..171B>

Paper: http://www.socastrosci.org/images/SAS_2016_Proceedings.pdf pages 171 - 184

Early Images of Sodium in the Tail of Comet Hale-Bopp

Authors: Buchanan, Tom

Publication: The Society for Astronomical Sciences 35th Annual Symposium on Telescope Science. Published by Society for Astronomical Sciences, 2016, pp.151-156

Publication Date: 05/2016

Origin: AUTHOR

Bibliographic Code: 2016SASS...35..151B

Abstract

Astronomers announced that sodium was discovered in the extended tail of Comet Hale-Bopp on 16 April 1997. A literature search uncovered three reports of sodium near the coma in February. Two additional references reported slit spectra of sodium in the extended tail on 09 March and 13 April, but neither reported the orientation of a sodium tail. This paper presents results of film spectra taken of Comet Hale-Bopp by the author with a spectrograph that he had designed and built. Images of ion tails were recorded between 09 March 1997 and 05 May 1997. Seven showed the extended sodium tail. The spectrum of 09 March is presented alongside a corresponding star chart. Several spectra show two streamers of ion tails and a singular sodium tail. The orientations of these tails were measured, tabulated, and shown graphically, along with the antisolar directions.

<http://adsabs.harvard.edu/abs/2016SASS...35..151B>

Paper: http://www.socastrosci.org/images/SAS_2016_Proceedings.pdf pages 151 - 156

Video: <https://youtu.be/g8F5AOKahSA>

Hexagon on Saturn

(See image on next page)

Paper:

<http://adsabs.harvard.edu/abs/2015SASS...34..27B>

or

http://www.socastrosci.org/images/SAS_2015_Proceedings.pdf ,pages 27 - 34, with following errata:

Under 3.2. Definitions of Terms, Replace existing Position A with:

1. Position A: azimuth of small circle center on large circle, center not shown to avoid clutter

Replace existing y: with: 8. y: vertical position of marking point on small circle

Under 3.3. Line 3: Add 'counter' before 'clockwise'

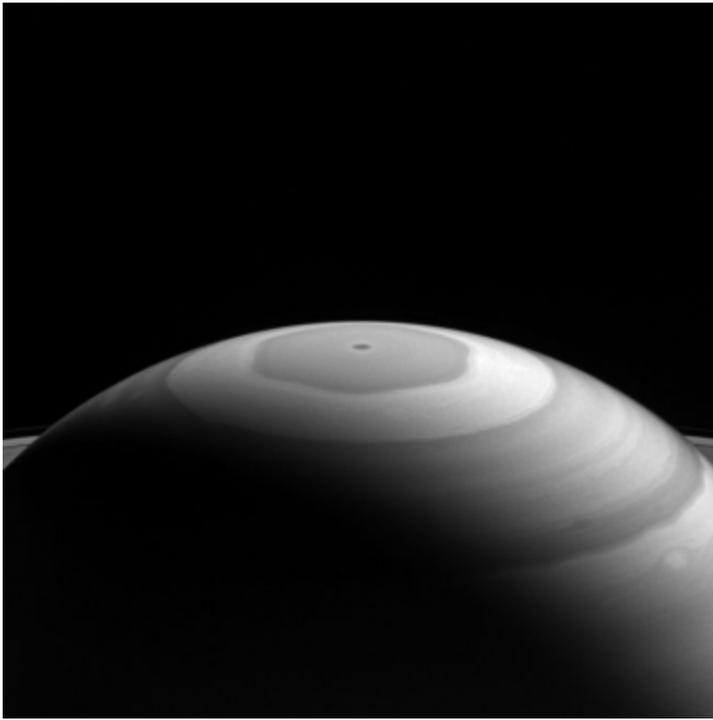
Under 3.3. Line 9: Delete 'counter'

Under 4. Last line: Delete 'in Equation 1' And replace with 'on Figure 2'

Video: <https://www.youtube.com/watch?v=pFV3rwaCGrE&feature=youtu.be>

Hyakutake Harvest

<http://adsabs.harvard.edu/abs/1995JALPO..39...41B>



Saturn's hexagon-shaped north polar vortex imaged by the Cassini spacecraft on September 5, 2016. Credit: NASA/JPL-Caltech/Space Science Institute

The Dawn of a New Era for Supernova 1987A

NASA/STScI News Release - February 24, 2017

Three decades ago, astronomers spotted one of the brightest exploding stars in more than 400 years. The titanic supernova, called Supernova 1987A (SN 1987A), blazed with the power of 100 million suns for several months following its discovery on Feb. 23, 1987.

Since that first sighting, SN 1987A has continued to fascinate astronomers with its spectacular light show. Located in the nearby Large Magellanic Cloud, it is the nearest supernova explosion observed in hundreds of years and the best opportunity yet for astronomers to study the phases before, during, and after the death of a star.

To commemorate the 30th anniversary of SN 1987A, new images, time-lapse movies, a data-based animation based on work led by Salvatore Orlando at INAF-Osservatorio Astronomico di Palermo, Italy, and a three-dimensional model are being released. By combining data from NASA's Hubble Space Telescope and Chandra X-ray Observatory, as well as the international Atacama Large Millimeter/submillimeter Array (ALMA), astronomers — and the public — can explore SN 1987A like never before.

Hubble has repeatedly observed SN 1987A since 1990, accumulating hundreds of images, and Chandra began observing SN 1987A shortly after its deployment in 1999. ALMA, a powerful array of 66 antennas, has been gathering high-resolution millimeter and submillimeter data on SN 1987A since its inception.

“The 30 years’ worth of observations of SN 1987A are important because they provide insight into the last stages of stellar evolution,” said Robert Kirshner of the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts, and the Gordon and Betty Moore Foundation in Palo Alto, California.



This Hubble Space Telescope image shows Supernova 1987A within the Large Magellanic Cloud, a neighboring galaxy to our Milky Way. Distant stars serve as a backdrop for Supernova 1987A, located in the center of the image. The bright ring around the central region of the exploded star is composed of material ejected by the star about 20,000 years before its demise. Gaseous clouds surround the supernova. The clouds' red color represents the glow of hydrogen gas, which is fueling a firestorm of star birth. Supernova 1987A was discovered in 1987, and Hubble began observing the exploded star in the early 1990s. This latest view was taken by Hubble's Wide Field Camera 3 in January 2017. The colors of the foreground and background stars were added from observations taken by Hubble's Wide Field Planetary Camera 2. Supernova 1987A resides 163,000 light-years away.

Credits: NASA, ESA, R. Kirshner (Harvard-Smithsonian Center for Astrophysics and Gordon and Betty Moore Foundation), and M. Mutchler and R. Avila (STScI)

The latest data from these powerful telescopes indicate that SN 1987A has passed an important threshold. The supernova shock wave is moving beyond the dense ring of gas produced late in the life of the pre-supernova star when a fast outflow or wind from the star collided with a slower wind generated in an earlier red giant phase of the star's evolution. What lies beyond the ring is poorly known at present, and depends on the details of the evolution of the star when it was a red giant.

“The details of this transition will give astronomers a better understanding of the life of the doomed star, and how it ended,” said Kari Frank of Penn State University who led the latest Chandra study of SN 1987A.

Supernovas such as SN 1987A can stir up the surrounding gas and trigger the formation of new stars and planets. The gas from which these stars and planets form will be enriched with elements such as carbon, nitrogen, oxygen, and iron, which are the basic components of all known life. These elements are forged inside the pre-supernova star and during the supernova explosion itself, and then dispersed into their host galaxy by expanding supernova remnants. Continued studies of SN 1987A should give unique insight into the early stages of this dispersal.

Some highlights from studies involving these telescopes include:

Hubble studies have revealed that the dense ring of gas around the supernova is glowing in optical light, and has a diameter of about a light-year. The ring was there at least 20,000 years before the star exploded. A flash of ultraviolet light from the explosion energized the gas in the ring, making it glow for decades.

The central structure visible inside the ring in the Hubble image has now grown to roughly half a light-year across. Most noticeable are two blobs of debris in the center of the supernova remnant racing away from each other at roughly 20 million miles an hour.

From 1999 until 2013, Chandra data showed an expanding ring of X-ray emission that had been steadily getting brighter. The blast wave from the original explosion has been bursting through and heating the ring of gas surrounding the supernova, producing X-ray emission.

Continued on next page

In the past few years, the ring has stopped getting brighter in X-rays. From about February 2013 until the last Chandra observation analyzed in September 2015 the total amount of low-energy X-rays has remained constant. Also, the bottom left part of the ring has started to fade. These changes provide evidence that the explosion's blast wave has moved beyond the ring into a region with less dense gas. This represents the end of an era for SN 1987A.

Beginning in 2012, astronomers used ALMA to observe the glowing remains of the supernova, studying how the remnant is actually forging vast amounts of new dust from the new elements created in the progenitor star. A portion of this dust will make its way into interstellar space and may become the building blocks of future stars and planets in another system.

These observations also suggest that dust in the early universe likely formed from similar supernova explosions.

Astronomers also are still looking for evidence of a black hole or a neutron star left behind by the blast. They observed a flash of neutrinos from the star just as it erupted. This detection makes astronomers quite certain a compact object formed as the center of the star collapsed — either a neutron star or a black hole — but no telescope has uncovered any evidence for one yet.

These latest visuals were made possible by combining several sources of information including simulations by Salvatore Orlando and collaborators that appear in this paper: <https://arxiv.org/abs/1508.02275>. The Chandra study by Frank et al. can be found online at <http://lanl.arxiv.org/abs/1608.02160>. Recent ALMA results on SN 87A are available at <https://arxiv.org/abs/1312.4086>.

The Chandra program is managed by NASA's Marshall Space Flight Center in Huntsville, Alabama for NASA's Science Mission Directorate in Washington. The Smithsonian Astrophysical Observatory in Cambridge, Massachusetts, controls Chandra's science and flight operations.

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

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.

ALMA is a partnership of ESO (representing its member states), NSF (USA) and NINS (Japan), together with NRC (Canada), NSC and ASIAA (Taiwan), and KASI (Republic of South Korea), in cooperation with the Republic of Chile. The Joint ALMA Observatory is operated by ESO, AUI/NRAO and NAOJ.

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/atlastro>.

AAC Officers and Contacts

President: Mark Banks President@AtlantaAstronomy.org

Program Chair: Richard Jakiel 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: Alan Coffelt,
Secretary@AtlantaAstronomy.org

Board Chair: Sharon Carruthers Treasurer@AtlantaAstronomy.org

Board: Brigitte Fessele, Contact info TBA

Board: David Lumpkin, Contact info TBA

Board: Steve Phillips sandsphillips@att.net

ALCor: Ken Olson, keneolson@yahoo.com

Elliott Chapter Director: Tim Geib director@ceastronomy.org

Elliott Observing Supervisor: David Whalen
observing@ceastronomy.org

Elliott Recording Secretary: Brian Tucker
secretary@ceastronomy.org

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: Brad Isley
sidewalkastronomy@AtlantaAstronomy.org

Light Tresspass: 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

- Mar 7th, Tuesday: Mercury at superior conjunction.
- Mar 12th, Sunday: Full Moon. Daylight Saving Time begins at 2:00AM.
- Mar 18th, Saturday: **AAC meeting at Emory University Science & Math Bldg at 7:00PM.**
- Mar 20th, Monday: Moon Last Quarter. Equinox at 6:29AM.
- Mar 25th, Saturday: **CE Chapter Meeting.** Venus at inferior conjunction. Try to see Venus in both the morning and evening sky!
- Mar 27th, Monday: New Moon.
- Mar 29th, Wednesday: Moon near Mercury.
- Mar 30th, Thursday: Moon near Mars.
- Apr 1st, Saturday: Mercury at Greatest Eastern Elongation.
- Apr 3rd, Monday: Moon First Quarter.
- Apr 6th, Thursday: Moon near Regulus.
- Apr 7th, Friday: Jupiter at Opposition.
- Apr 10th, Monday: Moon near Jupiter.
- Apr 11th, Tuesday: Full Moon.
- Apr 15th, Saturday: **AAC meeting location TBA.**
- Apr 16th, Sunday: Moon near Saturn.
- Apr 19th, Wednesday: Moon Last Quarter.
- Apr 20th, Thursday: Mercury at Inferior Conjunction.
- Apr 22nd, Saturday: **CE Chapter Meeting.** April Lyrids Meteor Shower.
- Apr 26th, Wednesday: New Moon.
- Apr 27th, Thursday - Apr 30th, Sunday: **AAC Zombie Party**
- May 2nd, Tuesday: Moon First Quarter.
- May 6th, Saturday: Eta Aquarids Meteor Shower.

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 with images separate but Word documents or PDFs are okay. **The deadline for April is Saturday, March 25. Submissions received 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

FROM: Tom Faber
506 Treeridge Parkway
Alpharetta, GA 30022

Atlanta Astronomy Club

P.O. Box 76155

Atlanta, GA 30358-1155

www.atlantaastronomy.org

On Twitter at <http://twitter.com/atlastro>