

The Focal Point

The Atlanta Astronomy Club
Established 1947
March 2012

Vol. 24 No. 10

Editor: Tom Faber

Table of Contents

- Page 1...** March General Meeting, Membership Renewal in March
Page 2... February Meeting Report
Page 3... CE Chapter Outreach Programs & Meeting Minutes
Page 4... Bradley Open House Series, *Focal Point* Archives, AL Info, "Dark Matter Core Defies Explanation in Hubble Image"
Page 5, 6... "Astronomers Watch Delayed Broadcast of a Powerful Stellar Eruption"
Page 7... AAC Online, Memberships, Club Officers & Contact Info
Page 8... Calendar, AAC List Serv Info, Focal Point Deadline

March General Meeting

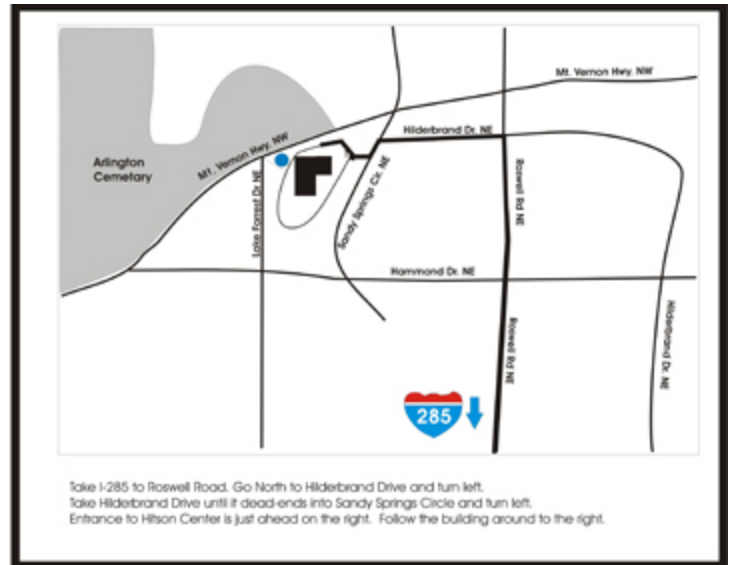
Join us for the March meeting of the Atlanta Astronomy Club on Friday March 16th at 8PM. Refreshments will be provided starting around 7:30PM. The meeting will be held at our new meeting location (first used in December for the Christmas Potluck) at the Parlor Room of the Hitson Center, in the Sandy Springs Methodist Church, 86 Mt Vernon Hwy, NE, Sandy Springs, GA 30328 (see map on right).

The Program:

Our guest speaker will be club member Dan Llewellyn. Dan's talk is titled "Stellar Cartography - Where are we in the Universe?" After Dan presents his talk there will be the business portion of the meeting. The meeting will run for about 2 hours total. If you have any announcements that you want to make during the meeting please contact our President, Mark Banks, so that he can schedule the time for you during the meeting. His contact information is on page 7.

Our Speaker:

Dan describes his talk: "As a former cartographer, I will be giving a talk on how we map the sky. Coordinate systems, sidereal time, diurnal motion and precession offer the skeletal framework of the sky in motion. Photographic plate solving and observational data form the basis for the solar system and our place in the Milky Way. Cepheid variables and the Hubble Law (redshift) are used as a distance indicators to give rise to the early nebulae being reclassified as island galaxies and their distances measured. The Sky surveys lead to our galaxy being in the local group of galaxies. Virgo is the nearest cluster of



galaxies, and we are considered "in" the Virgo Supercluster. The Sloan Sky Survey discovers the Sloan Great Wall, which the Coma Super cluster is at the center. New data will be shown, and many neat slides will help the audience visualize where we are in the known Universe."

Upcoming AAC Meetings:

Our meetings will usually be held on the 3rd Friday of the month. Future meeting dates for 2012 are Apr 20, May 18, June 15, and July 20. Meetings will be at the Parlor Room of the Hitson Center unless noted otherwise.

March is Membership Renewal Month

MEMBERSHIP RENEWALS: The AAC has moved to a "one-date-for-all" membership renewal. ALL CLUB MEMBERS, with some exceptions, should submit their \$30 (\$42 if you wish to receive the *Focal Point* by mail) dues for 2012 by March 20th. If you haven't renewed your membership yet please do so as soon as possible. (There will be an R1 in the upper right corner of your *Focal Point* mailing label if you receive it in the mail. If you receive the *Focal Point* online you will receive an email - be sure we have your current email address). If you see either an RF or an xxx on your mailing label that means that your membership is about to expire or has expired. Please send your renewal right away. Please note that as of January 1, 2011 the dues for receiving the mailed *Focal Point* have increased to \$42 per year. This increase is to cover the cost of printing and postage. Dues for members receiving the online version of the *Focal Point* will remain at \$30 per year. If you have questions, need to update your contact information, or wish to switch to receiving the *Focal Point* online (and save \$12 per year) please contact the AAC Treasurer Sharon Carruthers. Sharon's contact information is on pg. 7.

February Meeting Report

Photos by Tom Faber unless noted

The February meeting of the Atlanta Astronomy Club was held Friday February 17 at The Hitson Center in Sandy Springs, GA. About 60 members and guests were present. Our speaker for the evening was Dr. Les Johnson, Deputy Manager for the Advanced Concepts Office at NASA's George C. Marshall Space Flight Center in Huntsville, Alabama. Dr. Johnson presented a very informative talk about solar sails.

After the talk a number of club event announcements were made and awards were presented to nine club members for their participation in outreach events. The members receiving this award were: Jamie Anderson, Pixie Bruner, Sharon Carruthers, Mark Dove, Daniel Herron, Philip Johnson, Alton Leonard, Stephen Leonard, and Art Zorka. A special award was also presented to Deb Strycular, the Director of Sandy Springs Recreation and Parks Department, for assisting us in our new location and for 14 Night Sky Network programs in 2011-2012.

After the meeting ended a number of us, including our guest speaker, went to the nearby Mellow Mushroom for food, drink, and conversation.



Les Johnson begins his talk about solar sails.



Art Zorka presents a special award to Deb Strycular, the Director of Sandy Springs Recreation and Parks Department.



Outreach awards were presented to (l to r): Alton Leonard, Philip Johnson, Daniel Herron, Art Zorka, Mark Dove, Jamie Anderson, and Stephen Leonard (Sharon and Pixie weren't present at the meeting).



Jupiter and Venus high in the western sky before the meeting.



Some people did a little observing in the parking lot after the meeting. Photo by Philip Johnson.

CE Chapter Meeting Minutes

By Marie Lott, CE Recording Secretary

The February 18th meeting of the Charlie Elliott Chapter of the Atlanta Astronomy Club was held in the CEWC Visitor Center in Mansfield, GA at 3 PM with thirty-five people in attendance. Chapter Director Ken Poshedly welcomed visitors and led a brainstorming session about possible speakers for future meetings. Theo Ramakers announced that members of the chapter were scouting locations for public viewing of the Venus solar transit on June 5th in Covington, Barnesville, Grayson, and possibly other places. There was a lively discussion (which continued after the meeting and later on the Charlie Elliott Chapter's Facebook page) as to whether or not the waxing and waning moon crescents look different from the Northern and Southern hemispheres. The answer is "yes": a waxing moon appears as a right crescent to observers north of the equator but as a left crescent to observers south of the equator.

Six chapter members - Steve Siedentop, Steve Phillips, Marie Lott, Frank Garner, Dan Schmitt and Theo Ramakers - qualified for the Night Sky Network Outreach Award. They all received pins and certificates during the award ceremony. Thanks to all of them for their time and effort to reach out to so many schools and clubs.

The meeting's feature presentation was an excellent talk, "Star Hopping and the Messier Marathon", by the AAC's Board Chairman and former Observing Chair Daniel Herron, followed by Steve Phillips "This Month's Sky, February 2012". Both presentations are available on the chapter's web site, www.ceastronomy.org in the "Past Events" section. During the break between the talks we celebrated Galileo's birthday (February 15, 1564) with a fully decorated cake and cupcakes brought by Valerie Whalen.

Selected events visible in March:

Feb 28 - Mar 10: Mercury is more than 10° above the western horizon ½ hr after sunset. This is Mercury's best evening apparition in 2012.

Mar 7 - Waxing gibbous moon near Mars.

Mar 15 - Venus & Jupiter are just 3° apart. Look West 1 hour after sunset.

Small Telescope/Binocular Target List: double stars Bogardus (Auriga), El Nath (Taurus) and Gamma Persei (Perseus); galaxies M42 (Orion) and M81 & M82 (Ursa Major); open clusters M36, M37 & M38 (Auriga), M44 (Cancer), M45 (Taurus), and Trumpler 2 (Perseus); Supernova Remnant M1 (Taurus); Carbon Stars R Leporis (Lepus) and U Camelopardalis.

The featured object this month is Mars. Steve showed an entertaining movie short by Walt Disney on the Red Planet along with some helpful tips for its observation:

The best time to observe Mars is a few months before, during, and after opposition

Acclimatize your telescope for 30 - 60 minutes

Study Martian features on a map before you observe

Observe on nights with steady air and good seeing conditions while the planet is near the meridian

Use High Magnification to see details on the surface and in the atmosphere

Make regular sketches to train your eyes and brain to see fine detail

Observe frequently over several weeks to see both sides of the planet

Try using colored filters to improve image contrast

Rainy weather prevented the observing session after the meeting.

The next meeting of the chapter will be the quarterly potluck ("Dinner and a Movie"), followed by observing on the field on Saturday, March 24, 2012 at 5 PM in the Charlie Elliott Visitor Center in Mansfield, GA. All are welcome.

CE Chapter Outreach Programs

By Theo Ramakers - <http://ceastronomy.org/tramakers>

During a small award ceremony in the Chapter's February meeting, 6 chapter members received the Night Sky Network's Venus Transit Pins and a Certificate of Appreciation for their participation in events in 2011. To qualify one must participate in at least 5 events during the year. The recipients of the awards were: Marie Lott, Steve Siedentop, Steve Phillips, Dan Schmitt, Frank Garner and Theo Ramakers. Thanks to all of them, as well to those who did participate in some but not make it for 5 events, for their time and enthusiasm to bring Astronomy and Space Exploration to the community.



Seven events reaching out to the community again in February. The list of schools who ask us to return year after year is growing. In February we went back for the 3rd time to Puckett's Mill's Science and Technology night, for the second year and third event to Memorial Middle's Space Night, and new schools are being added every month. Palmetto Elementary had their first Science Night, Princeton Elementary their first Career Day, and two new events for Fairview Elementary in Covington and we travelled all the way to Savannah, to participate in Georgia Department of Education's STEM festival. For March we have 11 events planned. So if you have time, check our calendar on our website or the NSN site and come and help. It is so rewarding to see the brains of these young students being stimulated. After my presentation about MSL's Curiosity to Mars, with smiling faces, the students were ready to start designing the next space probe to be launched from KSC. :-)



Continued on next page



The Focal Point Archives

The AAC began publishing the *Focal Point* as a PDF online in June 1998. Since then every issue has, and still is, available for download from the club's web page. Recently that archive has expanded. Sharon Carruthers has scanned 61 issues of the AAC's newsletter (then called *The Atlanta Astronomers' Report*) from 1948 to 1977. Although many issues from this period are still missing these provide a valuable record of the club's early years. In addition I (Tom Faber) came across 19 issues of the *Focal Point* from the years 1995-1998 that I scanned to make available on the club's web site. Again not every issue during this period is available but it is another step in maintaining and making available to all a record of the AAC's history. Our web master Daniel Herron has uploaded these to the web site as PDF's for download. Just visit www.atlantaastronomy.org and click on the "Focal Point Archives" link on the right side of the page. If you have any of the missing issues of the club's newsletter that you would like to scan and submit to Daniel as a PDF please do!

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> You may also contact the AAC's Astronomical League Correspondent Art Zorka for more information about the AL's Observing Clubs at artzorka@yahoo.com or by phone at 404-633-8822.

Dark Matter Core Defies Explanation in Hubble Image

NASA/STScI News Release March 2, 2012

It was the result no one wanted to believe. Astronomers observed what appeared to be a clump of dark matter left behind during a bizarre wreck between massive clusters of galaxies.

The dark matter collected into a "dark core" containing far fewer galaxies than would be expected if the dark matter and galaxies hung together. Most of the galaxies apparently have sailed far away from the collision. This result could present a challenge to basic theories of dark matter, which predict that galaxies should be anchored to the invisible substance, even during the shock of a collision.

The initial observations, made in 2007, were so unusual that astronomers shrugged them off as unreal, due to poor data. However, new results from NASA's Hubble Space Telescope confirm that dark matter and galaxies parted ways in the gigantic merging galaxy cluster called Abell 520, located 2.4 billion light-years away.

Now, astronomers are left with the challenge of trying to explain dark matter's seemingly oddball behavior in this cluster.

"This result is a puzzle," said astronomer James Jee of the University of California, Davis, leader of the Hubble study. "Dark matter is not behaving

Continued on next page

Bradley Open House Series 2011-2012

Return of the Alumnae

Graduates of the Department of Physics & Astronomy have gone on to a wide range of graduate studies and careers. This year, our speakers are all returning alumnae who will tell us about their journeys since they have left Agnes Scott College, and the work or research that they are now doing. All Open Houses run from 8:00 - 10:00 PM unless noted.

March 23 - Spring Equinox and Open House Series

April 13 - Open House Lecture Series: Science Writing and Writing Science

May 11 - Open House Lecture Series: En Route to Smart Materials

For more information and updates see: <http://www.agnesscott.edu/academics/bradleyobservatory>



This composite image shows the distribution of dark matter, galaxies, and hot gas in the core of the merging galaxy cluster Abell 520, formed from a violent collision of massive galaxy clusters.

The natural-color image of the galaxies was taken with NASA's Hubble Space Telescope and with the Canada-France-Hawaii Telescope in Hawaii.

Superimposed on the image are "false-colored" maps showing the concentration of starlight, hot gas, and dark matter in the cluster. Starlight from galaxies, derived from observations by the Canada-France-Hawaii Telescope, is colored orange. The green-tinted regions show hot gas, as detected by NASA's Chandra X-ray Observatory. The gas is evidence that a collision took place. The blue-colored areas pinpoint the location of most of the mass in the cluster, which is dominated by dark matter. Dark matter is an invisible substance that makes up most of the universe's mass. The dark-matter map was derived from the Hubble Wide Field Planetary Camera 2 observations by detecting how light from distant objects is distorted by the cluster of galaxies, an effect called gravitational lensing.

The blend of blue and green in the center of the image reveals that a clump of dark matter resides near most of the hot gas, where very few galaxies are found. This finding confirms previous observations of a dark-matter core in the cluster. The result could present a challenge to basic theories of dark matter, which predict that galaxies should be anchored to dark matter, even during the shock of a collision.

Credit: NASA, ESA, CFHT, CXO, M.J. Jee (University of California, Davis), and A. Mahdavi (San Francisco State University)

as predicted, and it's not obviously clear what is going on. Theories of galaxy formation and dark matter must explain what we are seeing.”

A paper reporting the team's results has been accepted for publication in *The Astrophysical Journal* and is available online.

First detected about 80 years ago, dark matter is thought to be the gravitational “glue” that holds galaxies together. The mysterious invisible substance is not made of the same kind of matter that makes up stars, planets, and people. Astronomers know little about dark matter, yet it accounts for most of the universe's mass.

They have deduced dark matter's existence by observing its ghostly gravitational influence on normal matter. It's like hearing the music but not seeing the band.

One way to study dark matter is by analyzing smashups between galaxy clusters, the largest structures in the universe. When galaxy clusters collide, astronomers expect galaxies to tag along with the dark matter, like a dog on a leash. Clouds of intergalactic gas, however, plow into one another, slow down, and lag behind the impact.

That theory was supported by visible-light and X-ray observations of a colossal collision between two galaxy clusters called the Bullet Cluster. The galactic grouping has become a textbook example of how dark matter should behave.

But studies of Abell 520 showed that dark matter's behavior may not be so simple. The original observations found that the system's core was rich in dark matter and hot gas but contained no luminous galaxies, which normally would be seen in the same location as the dark matter. NASA's Chandra X-ray Observatory detected the hot gas. Astronomers used the Canada-France-Hawaii and Subaru telescopes atop Mauna Kea to infer the location of dark matter by measuring how the mysterious substance bends light from more distant background galaxies, an effect called gravitational lensing.

The astronomers then turned Hubble's Wide Field Planetary Camera 2 to help bail them out of this cosmic conundrum. Instead, to their chagrin, the Hubble observations helped confirm the earlier findings. Astronomers used Hubble to map the dark matter in the cluster through the gravitational lensing technique.

“Observations like those of Abell 520 are humbling in the sense that in spite of all the leaps and bounds in our understanding, every now and then, we are stopped cold,” explained Arif Babul of the University of Victoria in British Columbia, the team's senior theorist.

Is Abell 520 an oddball, or is the prevailing picture of dark matter flawed? Jee thinks it's too soon to tell.

“We know of maybe six examples of high-speed galaxy cluster collisions where the dark matter has been mapped,” Jee said. “But the Bullet Cluster and Abell 520 are the two that show the clearest evidence of recent mergers, and they are inconsistent with each other. No single theory explains the different behavior of dark matter in those two collisions. We need more examples.”

The team has proposed a half-dozen explanations for the findings, but each is unsettling for astronomers. “It's pick your poison,” said team member Andisheh Mahdavi of San Francisco State University in California, who led the original Abell 520 observations in 2007. One possible explanation for the discrepancy is that Abell 520 was a more complicated interaction than the Bullet Cluster encounter. Abell 520 may have formed from a collision between three galaxy clusters, instead of just two colliding systems in the case of the Bullet Cluster.

Another scenario is that some dark matter may be what astronomers call “sticky.” Like two snowballs smashing together, normal matter slams into each other during a collision and slows down. But dark matter blobs are thought to pass through each other during an encounter without slowing down. This scenario proposes that some dark matter interacts with itself and stays behind when galaxy clusters collide.

A third possibility is that the core contained many galaxies, but they were too dim to be seen, even by Hubble. Those galaxies would have to have formed dramatically fewer stars than other normal galaxies. Armed with the Hubble data, the group hopes to create a computer simulation to try to reconstruct the collision, hoping that it yields some answers to dark matter's weird behavior.

Astronomers Watch Delayed Broadcast of a Powerful Stellar Eruption

NASA/STScI News Release February 15, 2012

Astronomers are watching a delayed broadcast of a spectacular outburst from the unstable, behemoth double-star system Eta Carinae, an event initially seen on Earth nearly 170 years ago.

Dubbed the “Great Eruption,” the outburst first caught the attention of sky watchers in 1837 and was observed through 1858. But astronomers didn't have sophisticated science instruments to accurately record the star system's petulant activity.

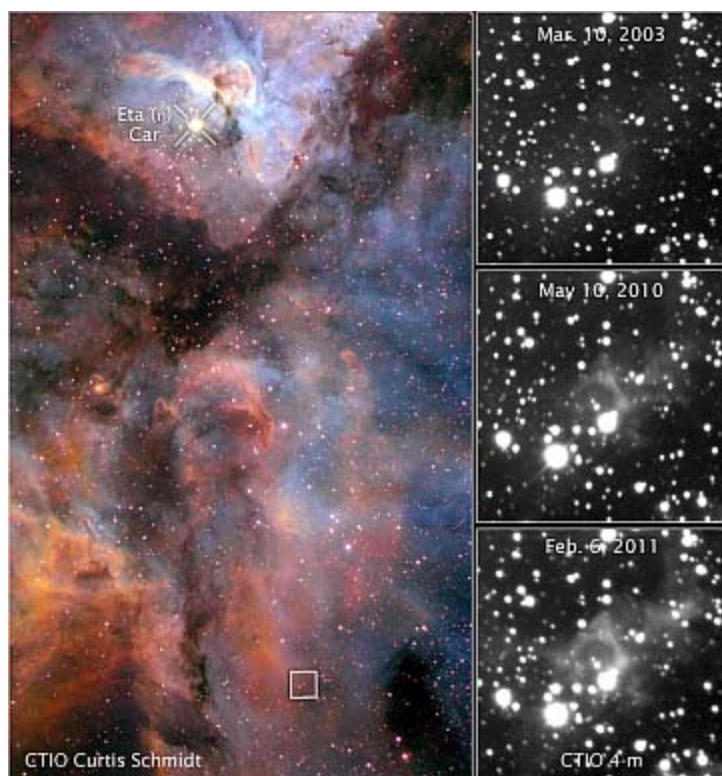
Luckily for today's astronomers, some of the light from the eruption took an indirect path to Earth and is just arriving now, providing an opportunity

Continued on next page

to analyze the outburst in detail. The wayward light was heading in a different direction, away from our planet, when it bounced off dust clouds lingering far from the turbulent stars and was rerouted to Earth, an effect called a “light echo.” Because of its longer path, the light reached Earth 170 years later than the light that arrived directly.

The observations of Eta Carinae’s light echo are providing new insight into the behavior of powerful massive stars on the brink of detonation. The views of the nearby erupting star reveal some unexpected results, which will force astronomers to modify physical models of the outburst.

“When the eruption was seen on Earth 170 years ago, there were no cameras capable of recording the event,” explained the study’s leader, Armin Rest of the Space Telescope Science Institute in Baltimore, Md. “Everything astronomers have known to date about Eta Carinae’s outburst



STScI-PRC2012-12a

These images reveal light from a massive stellar outburst in the Carina Nebula reflecting off dust clouds surrounding a behemoth double-star system.

The color image at left shows the Carina Nebula, a star-forming region located 7,500 light-years from Earth. The massive double-star system Eta Carinae resides near the top of the image. The star system, about 120 times more massive than the Sun, produced a spectacular outburst that was seen on Earth from 1837 to 1858.

But some of the light from the eruption took an indirect path and is just now reaching our planet. The light bounced off dust clouds (the boxed region about 100 light-years away at the bottom of the image) and was rerouted to Earth, a phenomenon called a light echo. The image was taken in February 2000 by the U.S. National Optical Astronomy Observatory’s Curtis Schmidt Telescope at the Cerro Tololo Inter-American Observatory (CTIO) in Chile.

The three black-and-white images at right show light from the eruption illuminating dust clouds near the doomed star system as it moves through them. The effect is like shining a flashlight on different regions of a vast cavern. The images were taken over an eight-year span by the U.S. National Optical Astronomy Observatory’s Blanco 4-meter telescope at the CTIO.

Credit: NASA, NOAO, and A. Rest (Space Telescope Science Institute, Baltimore, Md.) Acknowledgment: NOAO, AURA, NSF, and N. Smith (University of Arizona)

is from eyewitness accounts. Modern observations with science instruments were made years after the eruption actually happened. It’s as if nature has left behind a surveillance tape of the event, which we are now just beginning to watch. We can trace it year by year to see how the outburst changed.”

The team’s paper will appear Feb. 16 in a letter to the journal *Nature*.

Located 7,500 light-years from Earth, Eta Carinae is one of the largest and brightest star systems in our Milky Way galaxy. Although the chaotic duo is known for its petulant outbursts, the Great Eruption was the biggest ever observed. During the 20-year episode, Eta Carinae shed some 20 solar masses and became the second brightest star in the sky. Some of the outflow formed the system’s twin giant lobes. Before the epic event, the stellar pair was 140 times heftier than our Sun.

Because Eta Carinae is relatively nearby, astronomers have used a variety of telescopes, including the Hubble Space Telescope, to document its escapades. The team’s study involved a mix of visible-light and spectroscopic observations from ground-based telescopes.

The observations mark the first time astronomers have used spectroscopy to analyze a light echo from a star undergoing powerful recurring eruptions, though they have measured this unique phenomenon around exploding stars called supernovae. Spectroscopy captures a star’s “fingerprints,” providing details about its behavior, including the temperature and speed of the ejected material.

The delayed broadcast is giving astronomers a unique look at the outburst and turning up some surprises. The turbulent star system does not behave like other stars of its class. Eta Carinae is a member of a stellar class called Luminous Blue Variables, large, extremely bright stars that are prone to periodic outbursts. The temperature of the outflow from Eta Carinae’s central region, for example, is about 8,500 degrees Fahrenheit (5,000 Kelvin), which is much cooler than that of other erupting stars. “This star really seems to be an oddball,” Rest said. “Now we have to go back to the models and see what has to change to actually produce what we are measuring.”

Rest’s team first spotted the light echo while comparing visible-light observations he took of the stellar duo in 2010 and 2011 with the U.S. National Optical Astronomy Observatory’s Blanco 4-meter telescope at the Cerro Tololo Inter-American Observatory (CTIO) in Chile. He obtained another set of CTIO observations taken in 2003 by astronomer Nathan Smith of the University of Arizona in Tucson, which helped him piece together the whole 20-year outburst.

The images revealed light that seemed to dart through and illuminate a canyon of dust surrounding the doomed star system. “I was jumping up and down when I saw the light echo,” said Rest, who has studied light echoes from powerful supernova blasts. “I didn’t expect to see Eta Carinae’s light echo because the eruption was so much fainter than a supernova explosion. We knew it probably wasn’t material moving through space. To see something this close move across space would take decades of observations. We, however, saw the movement over a year’s time. That’s why we thought it was probably a light echo.”

Although the light in the images appears to move over time, it’s really an optical illusion. Each flash of light is reaching Earth at a different time, like a person’s voice echoing off the walls of a canyon.

The team followed up its study with spectroscopic observations, using the Carnegie Institution of Washington’s Magellan and du Pont telescopes at Las Campanas Observatory in Chile. That study helped the astronomers decode the light, revealing the outflow’s speed and temperature. The observations showed that ejected material was moving at roughly 445,000 miles an hour (more than 700,000 kilometers an hour), which matches predictions.

Continued on next page

Rest's group monitored changes in the intensity of the light echo using the Las Cumbres Observatory Global Telescope Network's Faulkes Telescope South in Siding Spring, Australia. The team then compared those measurements with a plot astronomers in the 1800s made of the light brightening and dimming over the course of the 20-year eruption. The new measurements matched the signature of the 1843 peak in brightness.

The team will continue to follow Eta Carinae because light from the outburst is still streaming to Earth. "We should see brightening again in six months from another increase in light that was seen in 1844," Rest said. "We hope to capture light from the outburst coming from different directions so that we can get a complete picture of the eruption."

Rest's team consists of J.L. Prieto, Carnegie Observatories, Pasadena, Calif.; N.R. Walborn and H.E. Bond, Space Telescope Science Institute, Baltimore, Md.; N. Smith, Steward Observatory, University of Arizona, Tucson; F.B. Bianco and D.A. Howell, Las Cumbres Observatory Global Telescope Network, Goleta, Calif., and University of California, Santa Barbara; R. Chornock, R.J. Foley, and W. Fong, Harvard-Smithsonian Center for Astrophysics, Cambridge, Mass.; D.L. Welch and B. Sinnott, McMaster University, Hamilton, Ontario; M.E. Huber, Johns Hopkins University, Baltimore, Md.; R.C. Smith, Cerro Tololo Inter-American Observatory, National Optical Astronomy Observatory, La Serena, Chile; I. Toledo, Atacama Large Millimeter Array (ALMA), Chile; D. Minniti, Pontificia Universidad Catolica, Santiago, Chile; and K. Mandel, Harvard-Smithsonian Center for Astrophysics, Cambridge, Mass., and Imperial College London, U.K.

Editor's Notes:

The Nature Science Paper by A. Rest et al. is available at this link:

<http://hubblesite.org/pubinfo/pdf/2012/12/pdf.pdf>

For more general information about Eta Carinae see:

http://en.wikipedia.org/wiki/Eta_carina

and

<http://stars.astro.illinois.edu/sow/etacar.html>



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

Program Chair: Richard Jakiel Programs@AtlantaAstronomy.org

Observing Chair/BoD Chair: Art Zorka
Observing@AtlantaAstronomy.org

Corresponding Secretary: Tom Faber
Focalpoint@AtlantaAstronomy.org

Treasurer: Sharon Carruthers Treasurer@AtlantaAstronomy.org

Recording Secretary: Pixie Bruner
Secretary@AtlantaAstronomy.org

Board Chair: Daniel Herron, Contact info TBA

Board: Brigitte Fessele, Contact info TBA

Board: David Lumpkin, Contact info TBA

Board: Theo Ramakers 770-464-3777
webmaster@CEastronomy.org

ALCor: Art Zorka 404-633-8822 (H) 404-247-2474 (C)
artzorka@yahoo.com

Elliott Chapter Director: Ken Poshedly director@ceastronomy.org

Elliott Observing Supervisor: Steven Phillips 770-601-9816
observing@ceastronomy.org

Elliott Recording Secretary: Marie Lott mtlott@comcast.net

Elliott Coordinator: Alesia Rast Alesia_Rast@mail.dnr.state.ga.us

Elliott Webmaster: Theo Ramakers 770-464-3777
webmaster@CEastronomy.org

Elliott Outreach Coordinator: Theo Ramakers 770-464-3777
outreach@ceastronomy.org

Georgia Astronomy in State Parks:

PSSG Chairman: Peter Macumber pmacumber@nightsky.org

PSSG Co-Chair: Joanne Cirincione
starrynights@AtlantaAstronomy.org

Sidewalk Astronomy: Brad Isley
sidewalkastronomy@AtlantaAstronomy.org

Light Trespass: Open - Contact Mark Banks if you would like to volunteer for this position

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

AAC Webmaster: Daniel Herron, Contact info TBA

The **Atlanta Astronomy Club, Inc.**, the South's largest and oldest astronomical society, meets at **8:00 P.M.** on the 3rd Friday of each month in the Parlor Room - Hitson Center in Sandy Springs, or occasionally at other locations or times. Membership fees are **\$30 (\$42)** for a family or single person membership. College Students membership fee is **\$15 (\$27)**. These fees are for a one year membership (\$12 per year extra charge to receive a printed *Focal Point* by mail).

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.

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

AAC Events are listed in BOLD

- March 3rd, Saturday: Mars at Opposition.
- March 8th, Thursday: Full Moon.
- March 11th, Sunday: Daylight Saving Time begins 2AM.
- March 12th, Monday: Venus near Jupiter.
- March 14th, Wednesday: Moon Last Quarter.
- March 16th, Friday: **AAC Meeting at Hitson Center, 8PM.**
- March 20th, Tuesday: Spring Equinox 1:14AM.
- March 22nd, Thursday: New Moon.

March 22-23: Zombie Party and Messier Marathon at DAV.

- March 23rd, Friday: Thin crescent moon visible about 1/2 hour after sunset. *Focal Point Deadline.*
- March 24th, Saturday: **CE Chapter Meeting, 5PM.**
- March 25th, Sunday: Moon near Jupiter.
- March 26th, Monday: Moon near Venus & M45. Venus Greatest Elongation East.
- March 30th, Friday: Moon First Quarter.
- April 6th, Friday: Full Moon.
- April 13th, Friday: Moon Last Quarter.
- April 15th, Sunday: Saturn at Opposition.
- April 18th, Wednesday: Mercury Greatest Elongation West.
- April 20th, Friday: **AAC Meeting at Hitson Center, 8PM.**
- April 21st, Saturday: **DSO at location TBA. CE Chapter Meeting, 5PM.** New Moon.
- April 22nd, Sunday: Lyrid Meteor Shower.
- April 27th, Friday: **May Focal Point Deadline.**
- April 29th, Sunday: Moon First Quarter.
- April 30th, Monday: Venus at Greatest Brilliancy.

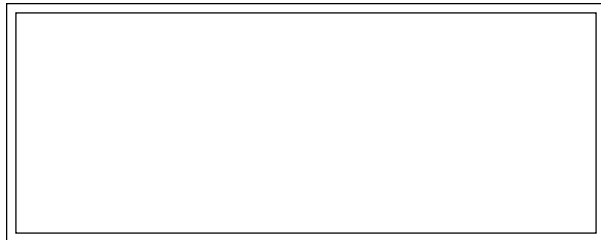
For more event listings see the calendar at : www.atlantaastronomy.org

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 . This list is owned by Lemmy Abbey.

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 April is Friday, March 23rd. Submissions after the deadline will go in the following month.**



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

Tom Faber
2206 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>