

The Focal Point

The Atlanta Astronomy Club
Established 1947
February 2012

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Editor: Tom Faber

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February General Meeting

Join us for the February meeting of the Atlanta Astronomy Club on Friday February 17th 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 Les Johnson, Deputy Manager for the Advanced Concepts Office at the NASA George C. Marshall Space Flight Center in Huntsville, Alabama. Les will present a talk titled "Solar Sails - How We Will Explore the Solar System on a Beam of Light." After Les 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:

Les is the Deputy Manager for NASA's Advanced Concepts Office at the Marshall Space Flight Center in Huntsville, Alabama. He is the co-author of three published popular science books, *Living Off the Land in Space*, *Solar Sails*, and *Paradise Regained: The Regreening of Earth*. His first science fiction novel, *Back to the Moon*, was published in December by Baen Books. He is editing an anthology for Baen called, "Going Interstellar"



that will be released in May 2012. Les was the technical consultant for the movie *Lost in Space*. NPR, CNN, Fox News, The Science Channel, and The Discovery Channel have all interviewed him. He appeared on the Discovery Science Channel in three episodes of their "Exodus Earth" series and the "How to Build A Starship" episode of Michio Kaku's 2010 Discovery Science Channel Series "Physics of the Impossible." He was the Chief Scientist for the ProSEDS space experiment, twice received NASA's Exceptional Achievement Medal, and holds 3 space technology patents. He has numerous peer-reviewed publications and was published in *Analog* magazine. His website is: www.lesjohnsonauthor.com

Upcoming AAC Meetings:

Our meetings will usually be held on the 3rd Friday of the month. Future meeting dates for 2012 are Mar 16, Apr 20, and May 18. Meetings will be at the Parlor Room of the Hitson Center unless noted otherwise.

From the President's Desk

Our primary mission is to help educate the public about astronomy as well as other related areas of science. In the world we live in today scientific and technological literacy will separate the have's from the have not's. Therefore it is imperative that we work toward the goal of better education in the areas of science and technology. Unfortunately this involves politics. Many of our elected leaders have little or no knowledge or education in the areas of technology and science. They need information on these subjects to make decisions that will affect all of us. We all need to contact our elected officials on issues such as NASA and the space program, Astronomy, basic research and development, and other related areas. If we

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January Meeting Minutes

By Pixie Bruner, AAC Recording Secretary. Photos by Tom Faber

The January meeting of the Atlanta Astronomy Club was held January 20 at The Hitson Center in Sandy Springs, GA. It was a foggy rainy night so no observing could be done. Approximately 30 people were in attendance and enjoyed delicious cake and cookies made by AAC Treasurer Sharon



Carruthers. Art Zorka was awarded the first ever “Keith ‘Kosmik Kow’ Amateur Astronomer Award” for his effort, dedication and enthusiasm for sharing the skies with others and educating (photo below). This new AAC award honors the qualities both the Kosmik Kow and now Art have, and makes them role models for amateur astronomers. Art accepted with humor and grace that the Kow would have been truly moo-ved by.



Daniel Herron received the AL “Carbon Star award” for viewing 100 carbon stars (photo top right). The constellation Lepus has a great carbon star visible currently so you can find one too. The yearly insanity of the Zombie Party is March 23-25th at the DAV. It’s time to do the Messier Marathon and at the Zombie, you get three tries to get all the Messier objects and three all nighters star-chasing. It also has the coolest astro-geek T-shirt you’ve ever seen besides PSSG shirts! Starting next month, a Beginners level meeting - presentation shall start at 7pm and run for 15 mins. These will be casual talks about basic astronomy and will be fun and informative. The full schedule of outreach and viewing calendar is available on the club website www.atlantaastronomy.org.



Daniel then came to the rescue and talked about the Messier Marathon (photo below), as our scheduled speaker got lost. Next month, we have a very special and high-tech talk and presentation - Les Johnson of NASA will be coming to present the talk he was originally scheduled to do at the November meeting. It should be fascinating and exciting. In March, Daniel Llewellyn will be speaking on “Stellar Cartography”. It is worth putting on the map..I mean fridge calendar, as well. Third Friday of the month - Hitson Center. PSSG 2012 shall be October 7-14th if the Mayan calendar is wrong :) Clear skies and happy stargazing!



Continued from page 1

don't communicate with them they may only hear from lobbyists. As we all know, lobbyists may not have the best interest of the country and our citizens in mind.

At the federal level talk to your congressional leaders. You may be surprised at how little they hear from individuals. At the state and local level school boards have a lot of control over the curriculum. This is an area where you can make a difference about what our children learn. I have heard some local school boards make comments about cutting the budget for science education because they don't think it's important. Please let them know what it means to "shoot yourself in the foot". Now get out there and vote!

Mark Banks, AAC President

Bradley Observatory 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.

February 10 - Open House Lecture Series: Considering Human Factors in the Design of Multimodal Displays for NASA

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>

CE Chapter Outreach Programs

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

The Chapter had a great start into 2012. Six Outreach programs in January in addition to the Chapter meeting with a total of 10 individual members participating in the events. And this for a winter month! We brought the Universe to Panola Mountain State Park, The Girl Scouts training camp and Hightower Trail Elementary School. This was the 8th Space Camp at Hightower Trail in which the Chapter participated. 96 students learned about astronomy, the sun, space exploration, and saw the universe through 5 different telescopes. They had a ball and could not get enough and would go back, to the back of the line, to take another look. February is lining up to be very active again. I am urging everyone who has a little time to come and help us. These events are very gratifying. Clear Skies.



Next Charlie Elliott Chapter Meeting

Join us for our next meeting at 3 p.m., Saturday, February 18, 2012, at Charlie Elliott Wildlife Center's Visitor Center.

Meeting Agenda

Feature Presentation: "Navigating the Skies by Star Hopping" Daniel Herron, Board Chair of the Atlanta Astronomy Club and former Observing Chair, will present a talk on how to observe the night sky without a computer - "Navigating the Skies by Star Hopping & an Introduction to Extreme Star Hopping, the Messier Marathon".

This Month's Sky: A short program of special objects conveniently placed in the night sky over the next month will be presented by Steven Phillips, CE chapter observing supervisor.

Sunset Time Alert: After the main programs, and if the meeting runs extra-long, a "Sunset Time Alert" will be announced. While we'd love for everyone to stay for the entire meeting, we also realize that some folks prefer to leave a bit earlier so as to set up their equipment at the observing field before dark. On February 18, sunset will occur at 18:21 p.m. EDT.

Observing after the Meeting: All are invited to the observing field immediately after the meeting (weather-permitting). Everyone is welcome. Place: Jon Wood Astronomy Field at Charlie Elliott Wildlife Center.

Future Meeting Dates: March 24, April 21, May 19, June 16, July 21, August 18, September 15, October 20, November 17, December 15.

What's Up? Fantastic Astronomy Tales

“Canals on Mars: A Scientific Morality Tale”

By Sharon Carruthers, AAC Treasurer

Once upon a time, (in the late 19th and early 20th centuries), some astronomers seriously believe that a race of Martians, either now dead or still existing, had built canals on their planet. The canals, a series of dark straight lines between 60° N. to 60° S. latitude, were believed to be an irrigation network, meant to transport water across the planet as it became more arid. The major proponent of this hypothesis was Percival Lowell.

The canals were first observed during the Mars opposition of 1877 by the Italian astronomer Giovanni Schiaparelli. Schiaparelli drew a map of these features and labeled them “*canali*”, which means channels, ducts or gullies. It does not seem that Schiaparelli thought they were anything more than natural geological features. The term “*canali*” had been first used in 1858 by Angelo Secchi to describe large features on Mars, but he did not observe the straight line channels seen by Schiaparelli.

A popular belief is that it was the mistranslation of “*canali*” into “canal”, with its implications of intelligent construction, instead of “channel”, that started the Martian-made Canal hypothesis. However others dispute this, as canal can refer to both natural AND man-made waterways; and Schiaparelli made no effort to correct the error, if he was aware of it.

Also, at the time, it was not improbable that Mars could have natural waterways. It has ice caps that advance and recede seasonally, dark areas that could be lakes and oceans (both Schiaparelli and W. H. Pickering saw dark nodes at the intersections of the “*canali*”), dark areas that seemed to get larger in the Martian summer (and thus could be either water bodies filling with polar cap run-off or areas of growing vegetation) and an atmosphere.

Others chose to believe that the “*canali*” were made by intelligent life, of whom the most famous proponent was Percival Lowell.

Percival Lawrence Lowell (1855 - 1916) was a wealthy Bostonian, a Harvard graduate with a degree in mathematics, world traveler and an

ardent amateur astronomer who became enamored by Mars after reading Sciaparelli’s 1893 studies on Mars and the “*canali*”. In 1894, he built an observatory in Flagstaff, Arizona to study Mars, believing that the canals were built by a Martian civilization to bring water from the ice caps to the deserts. He wrote three books on the subject, *Mars* (1895), *Mars and Its Canals* (1906), and *Mars As the Abode of Life* (1908), which popularized the idea in the public imagination.

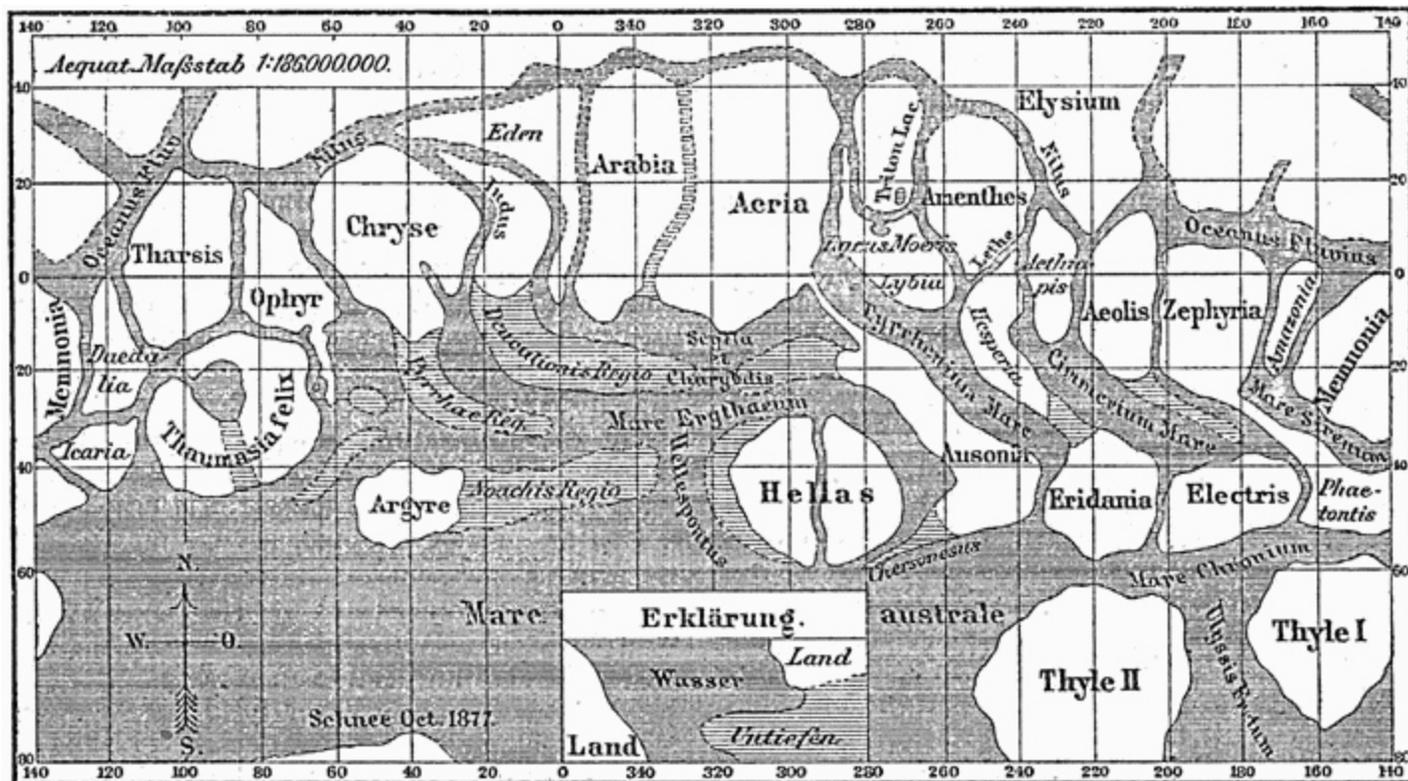
While a few other astronomers also claimed to see the canals, most of the astronomical community was skeptical that they existed. Most could not see the markings. Alfred Russell Wallace wrote *Is Mars Habitable?* in 1907, disputing the possibility of life on Mars due to its low atmospheric pressure that would make open water impossible; and pointing out that spectroscopic analysis had failed to find water in the Martian atmosphere. In the 1909 opposition, the sixty-inch Mount Wilson Observatory telescope showed only irregular geological features where Lowell had seen straight line canals, as did photographs taken at the Pic du Midi observatory in the French Pyrenees. After 1909, the idea of Martian canals was formally discredited within the professional scientific community. Lowell’s ideas were given the cold shoulder and, to regain the respect of the professional community, he largely abandoned promoting them. The Lowell Observatory went on to do research on Uranus, Venus and the search for Planet X (which was discovered in 1930 by Clyde Tombaugh and named Pluto).

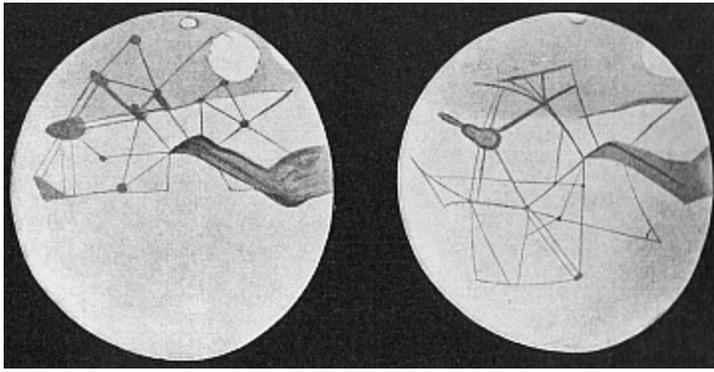
The final nails in the canal coffin were driven home by the Mariner missions. In 1965, Mariner 4 took the first close pictures of Mars and in 1972, Mariner 9 orbited and mapped its surface. No canal-like structures, either natural or martian-made were found.

So, why did Lowell and others see features that didn’t exist? The common consensus is that the canals were an optical illusion. Mars at its closest is very tiny. (In 2003, at its closest approach in 50,000 years it was only 25 arc seconds in diameter compared to the Moon, which is 1/2 degree or 1,800 arc seconds.) Astronomers were observing it visually for hours through Earth’s turbulent atmospheric soup, waiting for the few brief

Giovanni Schiaparelli Mars Map 1888

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Percival Lowell Mars Map

seconds when the air stabilized and the details snapped into view. When the dark features suddenly crisped up, their eyes and brains, connected the point-like features into lines. Hoping to see the lines probably made it easier to see them.

In 1903, Joseph Edward Evans and Edward Maunder conducted experiments at the Greenwich Observatory to demonstrate how the canals could be an optical illusion. They put pictures of Mars on a wall and had schoolboys make a sketch. Those at the front of the room drew only point features; those at the back of the room would draw lines connecting the point features.

The Moral of the Story is that even the most honest, educated and skilled of us can BE WRONG. Our senses and our brains, like any instrument we make, can have built in shortcomings. We cannot always overcome these shortcomings, but we can be aware of them. The great strength of science, as a means to understand our Universe, is that scientists present their findings openly to other scientists, who check the findings and look for flaws in facts, methodology and thinking. Any scientific finding is not the product of one mind but, over time, of thousands of minds coming to a consensus.

And the second moral, is that good can come out of bad. The Martin canal craze spawned some great literature: H.G. Wells' *"The War of the Worlds"*; Edgar Rice Burrough's *Barsoom* series; Ray Bradbury's *The Martian Chronicles*; and the *"Mars Attacks!"* trading cards which inspired the movie by Tim Burton.

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.

The Rosette by Daniel Llewellyn

First Deep Sky Image of the New Year! Rosette taken just after midnight at DAV on Jan 1. Stack of three 8 min and three 12 min exposures. AstroTech 65 Quad refractor, Starshoot Pro II color camera.



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 p. 7.

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!

NASA's NuSTAR Ships to Vandenberg AFB for March 14 Launch

Pasadena, Calif. -- NASA's Nuclear Spectroscopic Telescope Array, or NuSTAR, shipped to Vandenberg Air Force Base, Calif., on Tuesday, to be mated to its Pegasus launch vehicle. The observatory will detect X-rays from objects ranging from our sun to giant black holes billions of light-years away. It is scheduled to launch March 14 from an aircraft operating out of Kwajalein Atoll in the Marshall Islands.



Beginning the Journey to the Launch Pad - NASA's Nuclear Spectroscopic Telescope Array, or NuSTAR, mission is seen here being lowered into its shipping container at Orbital Sciences Corporation in Dulles, Va. The spacecraft is headed to Vandenberg Air Force Base in Central California, where it will be mated to its rocket. It is scheduled to launch from Kwajalein Atoll in the Marshall Islands on March 14. Image credit: NASA/JPL-Caltech/Orbital Sciences Corporation.

“The NuSTAR mission is unique because it will be the first NASA mission to focus X-rays in the high-energy range, creating the most detailed images ever taken in this slice of the electromagnetic spectrum,” said Fiona Harrison, the mission’s principal investigator at the California Institute of Technology in Pasadena, Calif.

The observatory shipped from Orbital Sciences Corporation in Dulles, Va., where the spacecraft and science instrument were integrated. It is scheduled to arrive at Vandenberg on Jan. 27, where it will be mated to the Pegasus, also built by Orbital, on Feb. 17.

The mission will be launched from the L-1011 “Stargazer” aircraft, which will take off near the equator from Kwajalein Atoll in the Pacific. NuSTAR and its Pegasus will fly from Vandenberg to Kwajalein attached to the underside of the L-1011, and are scheduled to arrive on March 7.

On launch day, after the airplane arrives at the planned drop site over the ocean, the Pegasus will drop from the L-1011 and carry NuSTAR to an orbit around Earth.

“NuSTAR is an engineering achievement, incorporating state-of-the-art high-energy X-ray mirrors and detectors that will enable years of astronomical discovery,” said Yunjin Kim, the mission’s project manager at NASA’s Jet Propulsion Laboratory in Pasadena.

NuSTAR’s advanced telescope consists of two sets of 133 concentric shells of mirrors, which were shaped from flexible glass similar to that found in laptop screens. Because X-rays require large focusing distances, or focal lengths, the telescope has a lengthy 33-foot (10-meter) mast, which will unfold a week after launch.



NASA's Nuclear Spectroscopic Telescope Array, or NuSTAR, mission arrived at Vandenberg Air Force Base in California January 27 after a cross-country trip by truck from the Orbital Sciences Corporation's manufacturing plant in Dulles, Va. The mission is scheduled to launch from Kwajalein Atoll in the Pacific Ocean on March 14.

Once the observatory is offloaded at Vandenberg, it will be moved into a processing hangar, joining the Pegasus XL rocket that is set to carry it to space. Over the weekend, technicians will remove its shipping container so that checkout and other processing activities can begin next week. Once the observatory is integrated with the rocket in mid-February, technicians will encapsulate it in the vehicle fairing.

After processing is completed, the rocket and spacecraft will be flown on Orbital's L-1011 carrier aircraft to the Ronald Reagan Ballistic Missile Defense Test Site at Kwajalein Atoll for launch in March. Image credit: NASA/Randy Beaudoin, VAFB.

These and other advances in technology will enable NuSTAR to explore the cosmic world of high-energy X-rays with much improved sensitivity and resolution over previous missions. During its two-year primary mission, NuSTAR will map the celestial sky in X-rays, surveying black holes, mapping supernova remnants, and studying particle jets travelling away from black holes near the speed of light.

NuSTAR also will probe the sun, looking for microflares theorized to be on the surface that could explain how the sun's million-degree corona, or atmosphere, is heated. It will even test a theory of dark matter, the mysterious substance making up about one-quarter of our universe, by searching the sun for evidence of a hypothesized dark matter particle.

“NuSTAR will provide an unprecedented capability to discover and study some of the most exotic objects in the universe, from the corpses of exploded stars in the Milky Way to supermassive black holes residing in the hearts of distant galaxies,” said Lou Kaluzienski, NuSTAR program scientist at NASA Headquarters in Washington.

About NuSTAR:

The NuSTAR mission will deploy the first focusing telescopes to image the sky in the high energy X-ray (6 - 79 keV) region of the electromagnetic spectrum. Our view of the universe in this spectral window has been limited because previous orbiting telescopes have not employed true focusing optics, but rather have used coded apertures that have intrinsically high backgrounds and limited sensitivity.

During a two-year primary mission phase, NuSTAR will map selected regions of the sky in order to:

1. Take a census of collapsed stars and black holes of different sizes by surveying regions surrounding the center of our Milky Way Galaxy and performing deep observations of the extragalactic sky;
2. Map recently-synthesized material in young supernova remnants to understand how stars explode and how elements are created; and
3. Understand what powers relativistic jets of particles from the most

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extreme active galaxies hosting supermassive black holes.

In addition to its core science program, NuSTAR will offer opportunities for a broad range of science investigations, ranging from probing cosmic ray origins to studying the extreme physics around collapsed stars to mapping microflares on the surface of the Sun. NuSTAR will also respond to targets of opportunity including supernovae and gamma-ray bursts.

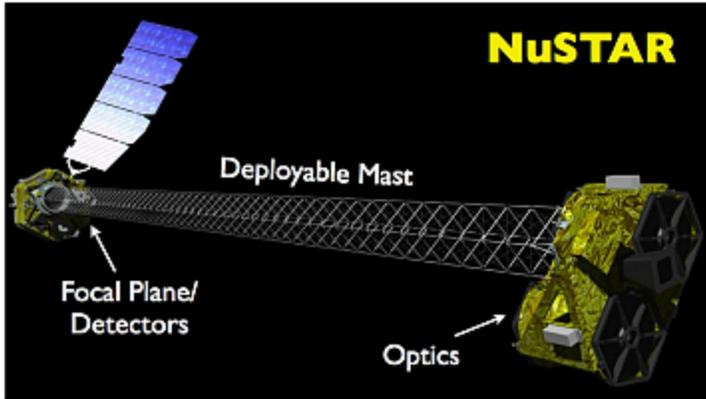


Diagram of NuSTAR when fully extended in orbit. Credit: NASA/JPL

The NuSTAR instrument consists of two co-aligned grazing incidence telescopes with specially coated optics and newly developed detectors that extend sensitivity to higher energies as compared to previous missions such as Chandra and XMM. After launching into orbit on a small rocket, the NuSTAR telescope extends to achieve a 10-meter focal length. The observatory will provide a combination of sensitivity, spatial, and spectral resolution factors of 10 to 100 improved over previous missions that have operated at these X-ray energies.

NuSTAR is a small-explorer mission managed by JPL for NASA's Science Mission Directorate. The spacecraft was built by Orbital Sciences Corporation. Its instrument was built by a consortium including Caltech, JPL, Columbia University, New York, N.Y., NASA's Goddard Space Flight Center in Greenbelt, Md., the Danish Technical University in Denmark, the University of California, Berkeley, and ATK-Goleta. NuSTAR will be operated by U.C. Berkeley, with the Italian Space Agency providing its equatorial ground station located at Malindi, Kenya. NASA's Explorer Program is managed by Goddard. JPL is managed by Caltech for NASA. For more information, visit <http://www.nasa.gov/nustar> and <http://www.nustar.caltech.edu/>.

The **Atlanta Astronomy Club, Inc.**, the South's largest and oldest astronomical society, meets at **8:00 P.M.** on the Friday closest to full moon of each month at Emory University's White Hall 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.

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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Board: Brigitte Fessele, Contact info TBA

Board: David Lumpkin, Contact info TBA

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Elliott Webmaster: Theo Ramakers 770-464-3777
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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

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

AAC Events are listed in **BOLD**

- February 7th, Tuesday: Full Moon.
February 9th, Thursday: Venus near Uranus evening. Moon near Mars.
February 10th, Friday: Bradley Observatory Open House, 8PM, See p.3
February 14th, Tuesday: Moon Last Quarter.
February 17th, Friday: **AAC Meeting at Hitson Center, 8PM.**
February 18th, Saturday: **CE Chapter Meeting, 3PM.**
February 19th, Sunday: Neptune Conjunction with the Sun.
February 21st, Tuesday: New Moon.
February 22nd, Wednesday: Very thin crescent moon near Mercury about 1/2 hour after sunset.
February 24th, Friday: **Focal Point Deadline.**
February 25th, Saturday: Moon near Venus.
February 29th, Wednesday: Moon First Quarter.
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 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, 3PM.**
March 25th, Sunday: Moon near Jupiter.
March 26th, Monday: Moon near Venus & M45.

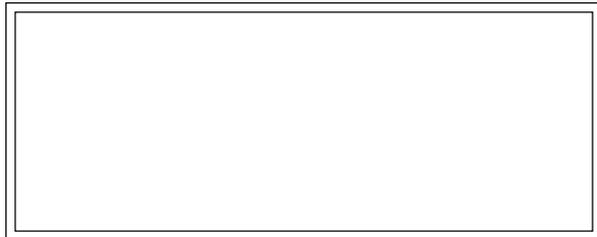
For more event listings see the calendar at : www.atlantaastronomy.org

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 March is Friday, February 24th. Submissions after the deadline will go in the following month.**



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

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www.atlantaastronomy.org

Atlanta, GA 30358-1155

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Tom Faber

FROM:

Newsletter of The Atlanta Astronomy Club, Inc.



The Focal Point