The Focal Point

The Atlanta Astronomy Club
Established 1947
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Editor: Tom Faber

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September General Meeting

by Keith "Kosmic Kow" Burns, AAC President

The next meeting of the Atlanta Astronomy Club will be held on September 19th. We have shifted the meeting schedule to follow more closely with the lunar calendar (near Full Moon). The meeting will take place in room 207 of White Hall on the Emory University Campus. The last several years we have also started to include several short talks before the main talk geared towards beginners or anyone wanting ideas on objects to look for when out under the stars with their telescopes. Our featured speaker of the night is Dr Chris Sirola who will speak on the Tunguska Explosion.

Directions are on page 7 of the Focal Point and on our website. Note that Emory is in the process of making improvements to the parking and roads. So for the next year we will have to endure road construction plus the closing of some of our favorite parking spots. For now the best places to park are the Peavine and Fishburne parking decks. Fishburne deck is located on Fishburne Drive which is accessible from North Decatur Road and turn onto Dowman and then right on Fishburne. You can also access Fishburne Dr from Clifton Rd southbound on right before N. Decatur Rd. The Peavine deck is accessible from North Decatur Rd. Turn onto Oxford Rd. Take that to back entrance of Emory and turn onto Eagle Row. Take that to the Peavine Parking deck.

The best thing about our meetings is the socializing that goes on, plus we also love to hear the latest on new discoveries in science. The last several years we have also started to include several short talks before the main talk geared towards beginners or anyone wanting ideas on objects to look for when out under the stars with their telescopes.

The Talk

The following is in the speaker's own words: "On June 30th, 1908, an explosion occurred in the Tunguska region of Russia that devastated the landscape over thousands of square miles. Perhaps surprisingly, the exact cause of the explosion is still unknown. We will trace the history of the Tunguska Event, including a variety of possible causes and how people reacted to it. Finally, we will review three modern views of the event and discuss the merits of each."

Speaker Biography

Dr. Chris Sirola earned a B.S. in astrophysics from the University of Wisconsin-Madison (in 1988), and an M.S. in physics (in 1990) and a Ph.D. in astronomy (1995) from the University of Pittsburgh. His Ph.D. research was on the topic of the geometry & structure of QSOs ("quasi-stellar objects"); he now focuses on physical science education. He is currently

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Peach State Star Gaze is Approaching!!!

by Peter Macumber, PSSG Chair

The PSSG will be held for the second year at our new home at the Deerlick Astronomy Village (DAV). Come and join us for the week or a couple of days under some of the darkest skies in Georgia. This is the 15th year of the Peach State Star Gaze. In order to celebrate our 15th birthday, we will have a party Friday evening with cake and ice cream. Micki's Kitchen will be back, providing food and drink throughout the day and night.

Speakers are lined up to provide us with varied and comprehensive talks and workshops. Don Parker, Ron Buta, Bill Keel, Charlie Warren, Jonn

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The AAC field at DAV during the PSSG'07 - Photo by Tom Faber.

an assistant professor in the Department of Physics & Astronomy at The University of Southern Misssisippi and is the head of their Physics Licensure program (for students who wish to become physics teachers in high school). Other scholarly activities include collaborations with colleagues in Southern's School of Music, collaborations with other licensure programs, and writing a bi-weekly science column in the local newspaper (the Hattiesburg American).

He is a native Cheesehead (Wisconsin native) and has minor battles with his wife Susan when his Green Bay Packers play her Carolina Panthers. Natalie (age 6), Joshua (age 6), and Zachary (age 6) - those ages are not a typo! He charges a dollar for anyone who uses the phrase "You must have your hands full!" or any other similar language when referring to the kids.

October-December Meeting Announcements

October 17th, Dr Angela Sarrazine Astronomer at Fernbank Science Center will give a talk on "Open Cluster Research: Strengthening the Cosmic Distance Ladder."

November 14th, Speaker & Topic TBA.

December 13th (Saturday), Christmas Dinner and New Planetarium Show. Titled, " The Wonders of the Giants," a Production of Over Productive Imagination Productions. Location is Bradley Observatory on the Agnes Scott College campus.

PSSG

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Serrie and the NASA Bus are all scheduled to appear. Vendors are lined up to provide you with an opportunity to buy that "gotta have" accessory. An impressive collection of door prizes is accumulating to be won by the attendees.

Program and Speakers (Information is subject to change)

Don Parker: Thursday - Amateur Contributions to Solar System Astronomy

Ron Buta: Friday and Saturday - Astronomy and the Coal Age of Alabama: The Minkin Paleozoic Footprint Site in north-central Alabama is a window to Earth's Coal Age. Here, people have found the footprints of animals that lived long before dinosaurs walked the Earth. One of the most interesting things about the site is its age. The rocks are part of the Pottsville Formation, which has been dated at about 310 Myr old. What does such an age really mean? In my presentation, I will describe the :deep time" represented by the Minkin Site in terms of astronomy: how does it compare to the ages of stars, the timescales of movement in the Milky Way Galaxy, the orbit of the Sun in the Milky Way, the rotation of the Milky Way, the distances to galaxies, and other interesting timescales. What did the star-gazing tetra pods of Alabama's Coal Age see in their sky? What were the other planets like? There is much we can learn by asking such questions.

Rendezvous with Birr Castle: a Visit to the Heart of Early Irish Astronomy - Birr Castle, in Offaly County, Ireland, is a special place in the history of astronomy. It was here where, in the 1840s, William Parsons, the Third Earl of Rosse, built the world's largest telescope and visually discovered the spiral structure of galaxies. In this presentation, I will describe what I saw when I visited the grounds of the castle in July, 2007, and will show photographs of the recently built replica of the old telescope, the famous 72-inch "Leviathan."

Bill Keel: Thursday and Saturday - Astronomy for a Flat World - the Public and the Data: The spread of networking and computer familiarity raises exciting new possibilities for public involvement in research. We've seen SETI@home, Einstein@home, and so on. The next step was taken with the Galaxy Zoo project, harnessing an unexpected 125,000 participants worldwide to classify galaxies from the Sloan Digital Sky Survey in ways that software still doesn't do as well as the human brain. This effort has solved questions about galaxy orientation, raised new questions about whether color or form is more important in galaxy history, and provided new samples of galaxies for studies of late star formation and dust content, The team has been especially excited about the discovery of "Hanny's Voorwerp", which seems to be gas illuminated by a dying quasar only 100,000 years ago - for which follow up Hubble observing approval was announced on the 25th birthday of its discoverer, a Dutch schoolteacher. Galaxy Zoo 2 will go public shortly, and arrangements have been made for Galaxy Zoo 3 as new surveys are carried out. This project has demonstrated what a win-win proposition this kind of global public involvement can become.

Charlie Warren: Talk topic TBD

Jonn Serrie - The Stargazer's Journey: Jonn will play music during the evening **Friday night** under the starry skies of the DAV.

If it happens to be cloudy we will run movies in the Big Tent.

This year's PSSG starts on Sunday, September 28th and runs a full week until Sunday, October 5th. The website has been updated with new information and pictures. Check out the details at http://www.AtlantaAstronomy.Org/PSSG. If you register online, you can use Pay Pal or print the form and mail it with a check. If you wish to volunteer and help in the organization and running of the event, please contact Joanne Cirincione (starrynights@AtlantaAstronomy.org). As a special benefit for volunteers, we have a Speaker and Volunteer dinner on Saturday evening. Registration is same price as last year, but we have lowered the entrance and camping fees. These savings will help you pay for the extra cost of gas. Deadline for early registration is September 5th. Don't delay - we want to see you at the 15th Annual Peach State Star Gaze!

The DAV and Peach State have some of the darkest skies in Georgia!

AAC August General Meeting Minutes

by Richard Jakiel, AAC Recording Secretary

Meeting photos by Tom Faber

The August General Meeting of the AAC began at promptly at 8 PM, with president Keith Burns presiding. Approximately 35 members and guests were in attendance. After introductions and news announcements, Keith called upon Dave "Moe" Lumpkin for a report on Deep Sky and related observing events. Dave discussed the next couple upcoming events, plus mentioned that WSB will be running a segment featuring the AAC on their Brasstown Bald Show (slated for 9/8/08). Also brought up was the possibility of moving some of the DSO events to closer sites such as Charlie Elliot to cut down on gas costs for those participating members.

Next up was Peter Macumber, PSSG Chairman. He mentioned that the last day to pre-register and also order a T-shirt was Sept. 5. Just go to the

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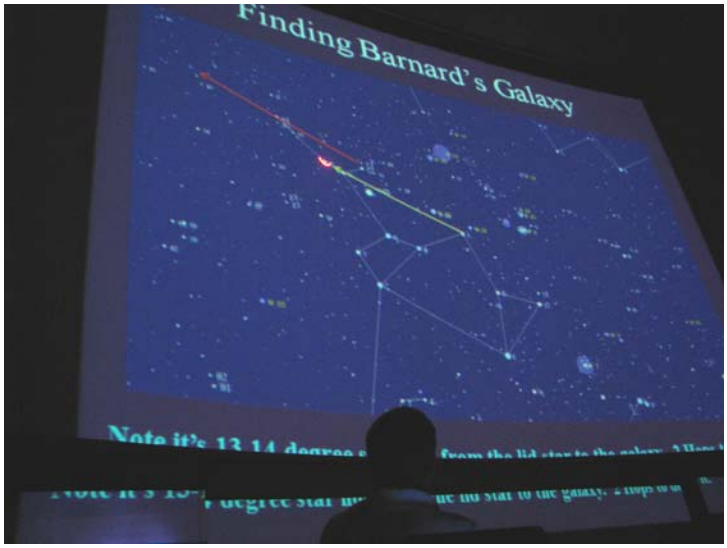
AAC's webpage for PSSG 2008 registration and other star party information.

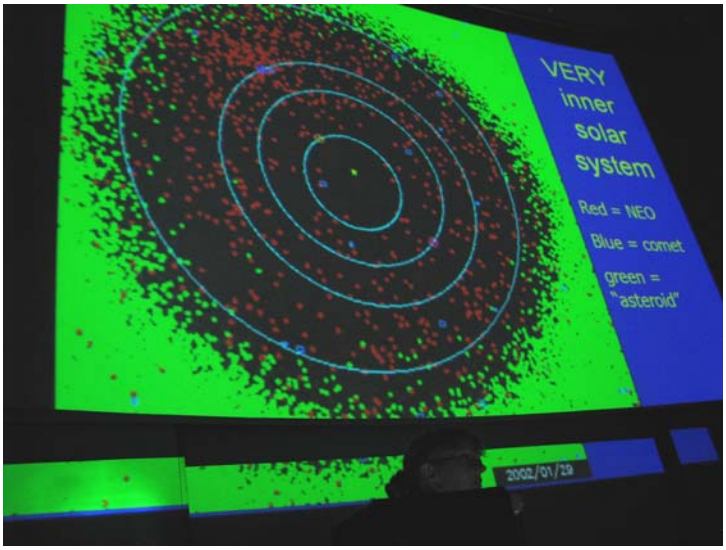
Art Zorka started the "short programs" phase of the meeting off with a review of the AL's Urban Club. Designed for today's light polluted skies, this observing program covers a rather extensive range of targets for the urban observer. After Art finished up, Keith started a new installation of "There's Nothing to See" - this time focusing on objects in Sagittarius (photo below). These were mostly "big and bright" (M24, M8 and M22) and then he threw in Barnard's Galaxy (NGC 6822) just to keep things honest.

Main Program

The evening's main speaker was Dr. Amy Lovell of Agnes Scott University. Her presentation - *Asteroids and Comets for Everyone* was a wide ranging overview of what we now know of these objects and their connection with meteor showers (photo bottom). Perhaps the most interesting was the animated graphics of all the known comets/asteroids (inner and outer solar system) over a 50 year interval (photo above right). Other charts/graphs of the Kuiper Belt Objects and the wide variety of asteroid and comet images provided lots of discussion and questions at the end of her talk.

After the close of the meeting, many AAC members headed off to Athens Pizza for the "meeting after the meeting".





Charlie Elliot Chapter Meeting Minutes

by Ken Poshedly, CE Recording Secretary

The July 26 meeting of the Charlie Elliott Chapter of the Atlanta Astronomy Club was called to order at 5:15 p.m. by chapter director Theo Ramakers. Present were 20 members and guests. Overcast weather prevailed, thus, no activities were scheduled on the the observing field following the meeting.

Following the welcoming remarks by Theo, Debbie Jones took the stand and explained the Astronomical League's requirements of the Messier Club program. Following the explanation, she did once more present an award to a longstanding member: Ray Major. Ray had completed the requirements for Honorary Messier Club from the AL some time ago and was now awarded the Honorary Messier Club membership which included the pin and a certificate along with a letter signed by the president of the Astronomical League (photo below - by Clevis Jones). Ray was congratulated for this excellent achievement. This was an inspiration to all of us!

Next on the agenda was the feature presentation by Fred Buls on "Solar System Probes". Fred's presentation provided a fairly detailed look at both U.S., European and Asian probes and included details of even the multi-instrument probes. Fred has a great website at http://facstaff.gpc.edu/~fbuls/astindex.html

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There was a brief recess after Fred's program. Following the recess, official proceedings continued:

* The minutes of last month's meeting were unanimously approved.

* Theo Ramakers provided a wrap-up about the good work contributed by our members at the CEWMA Outreach programs on July 9, 16, 20 and 23; recognized imaging work by Clevis Jones (solar image testing), Stephen Ramsden (more solar imaging), Jon Wood, Carlos Flores and Jim Honeycutt (whose lunar image was featured on the cover of the latest issue of the Journal of the Assn of Lunar & Planetary Observers), Larry Owens (with a neat time-lapse series of images called "One Hour in the Life of Jupiter"); Theo also presented a NASA video about the GLAST project (Gamma-ray Large Area Space Telescope), invited all to explore the chapter's revamped website at www.ceastronomy.org and announced that Carlos Flores has donated a number of astro DVDs to the chapter.

* In his latest installment of "Observing 101", Jon Wood covered a number of sky events over the following weeks; repeated the announcement from last month about the sign-up form mailbox; and presented a great series of visual slides on his upgrades to his web page at http://ceastronomy.org/blog/observing; he also spoke highly of various software programs which he himself finds useful including Celestia, Lunar Phase Pro and the Virtual Moon Atlas. The meeting was adjourned at 7:30 p.m.

Charlie Elliott Future Meetings

Future meetings are on: Sep. 27, Oct. 25 (set CE meeting schedule for 2009), Nov. 29, Dec. 27. For meeting updates and other information please check the CEastronomy website: http://www.CEastronomy.org

Bradley Open House Series 2008-2009 "Astronomy Before Galileo"

Humans have been gazing at the stars since they could look up, and have kept written records about motions in the heavens for millenia. This year, we will explore the rich history of astronomy and astronomical thought that predates Galileo. Our speakers will come from a variety of ancient disciplines including astronomy, architecture, classical studies, history and theology. All talks at 8PM unless noted. See http://bradley.agnesscott.edu/ for more information.

Fall 2008

September 19 - William A. Calder Fall Equinox Concert & Open House, Tracy Laird (Agnes Scott College) - Songs from Space: Aliens, UFOs and other Intergalactic Themes in American Music.

October 10 - Mike Lynn (Agnes Scott College) - "Copernicus, Revolutions, and Religion in the Sixteenth Century" Doors open at 7 PM for "Moon Festival" activities (sponsored by the Japanese Cultural Events Committee)

November 14 - Amy Lovell (Agnes Scott College) - "Venus and Meso-American Astronomy"

December 12 - Chris De Pree (Agnes Scott College) - "Tycho Brahe and Uraniborg"

Spring 2009

February 13 - Megan Drinkwater (Agnes Scott College) - Title TBA

March 20 - W. A. Calder Spring Equinox Concert & Open House

April 10 - Topic TBA

May 8 - Bill Brown (Columbia Theological Seminary) - Title TBA

Keith's Brasstown Observing Report

by Keith "Kosmic Kow" Burns, AAC President

Brasstown done gone. While many are expecting one of my colorful writeups from the past, only having had 2 hours of sleep prevents that right now. Perhaps later. Until then, here is a brief description. Pull out your translators!

Saturday afternoon. Hot and humid. Lots of sweating. Packing. Driving. Spending money on gas. Still high but at least a bit lower than before. Food stop. Subway or no way. Heavy Rain. Wind. Flooded roads. Hail. Lightning. Quiet finally. Fog starting. Lots of fog. Home Depot stop. Car show in downtown Blairsville. Are we there yet? Lots of curves and hills. Lots of cows in field behnd house. Old man sitting in chair in front yard. Cow grazing next to him outside fence. What? Arrive Brasstown parking lot.

Dave in chair. Chuck in chair. Dave asks where? Set up there. Channel 2 reporter here. Skies clearing but... Keith setup equipment. Why asked? Why not response. Camp hosts come down. Tim arrives. Tim sets up. Dave interview. Dan interview. Sunset wows. Skies still okay but.. Newbies view Jupiter in Keith's scope. Oooos and Aaaaas. Keith's new laptop. More video taping. Skies clear then cloud over. Repeat process 100 times. Keith sacrifices laptop.

Dave's weather phone confused. Forecast amuck. Clear next hour. Repeat forecast until correct. Group veges in circle. Need sacrifice. Chuck leaves. Tim leaves. Fog settles in. Keith packs. 1AM bedtime. 3AM Keith awake. Jupiter visible. Sky full of stars. WOW! Keith pulls out scope. Keith unpacks. Put on Wagner and Strauss music. Phone Dave across parking lot. Group awakens. Observing for 2 1/2 hours. Scope computer needs new batteries. No 9 volt batteries. 2 flashlights die. No 9 volt batteries. Okay star hop. No coffee so Diet Coke. Raisins and peanut butter crackers energize brain after hitting restart. Dave and Dan get fall sky tour by Keith.

Many oooos and aaaaaas. Meteor shooting gallery. WOW! Aquarids, Capricornids, and Perseids showers. North south satellites. Iridium satellite glow. Orion rising. Hints of sun light to east. Sky brighting. Time to quit. Attempt to see star Sirius before sunrise fall. Packup. Convoy down hill. Fog world. Geez lots of fog. Shortcut to town. Trust Dave's GPS. Oh, the Fog. Huddle House stop. Any port in fog storm. Crawl home. Fog lifts finally. Falling asleep. More caffine. Stop in Canton. Storm damage from I-75 west to home. Unpack. Type this message. Good night.

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

First Light for Fermi Space Telescope

NASA News Release - August 26, 2008

NASA's newest space telescope, formerly known as GLAST, has passed its orbital checkout with flying colors, kicking off a mission to explore the violent and unpredictable gamma ray universe.

It's getting started with a new name: NASA announced today that GLAST has been renamed the Fermi Gamma-ray Space Telescope in honor of Prof. Enrico Fermi (1901-1954), a pioneer in high-energy physics.

"Enrico Fermi was the first person to suggest how cosmic particles could be accelerated to high speeds," said Paul Hertz, chief scientist for NASA's Science Mission Directorate at NASA Headquarters in Washington. "His theory provides the foundation for understanding the new phenomena his namesake telescope will discover."

Scientists expect Fermi, by observing energetic gamma rays, to discover many new pulsars, reveal the inner workings of supermassive black holes, and help physicists search for new laws of Nature.

For two months following the spacecraft's June 11, 2008, launch, scientists tested and calibrated its two instruments, the Large Area Telescope (LAT) and the GLAST Burst Monitor (GBM).

Today, the Large Area Telescope team unveiled an all-sky image showing the glowing gas of the Milky Way, blinking pulsars, and a flaring galaxy billions of light-years away. The map combines 95 hours of the instrument's "first light" observations (Image shown below).

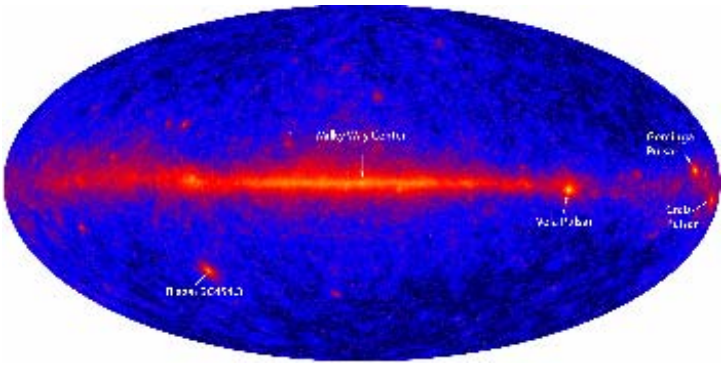
A similar image, produced by NASA's now-defunct Compton Gamma-ray Observatory, took years of observations to produce. With Fermi's superior sensitivity, new discoveries are sure to follow.

Fermi's Large Area Telescope scans the entire sky every three hours when operating in "survey mode," which will occupy most of the telescope's observing time during the first year of operations. These fast snapshots let scientists monitor rapid changes characteristic of the violent gamma-ray universe. The telescope is sensitive to photons with energies ranging from 20 MeV (million electron volts) to over 300 GeV (billion electron volts). The high end of this range, which corresponds to energies more than 5 million times greater than dental X-rays, is little explored.

The spacecraft's secondary instrument, the GBM, spotted 31 explosions known as gamma-ray bursts in its first month of operations alone. These high-energy blasts occur when massive stars die or when orbiting neutron stars spiral together and merge.

The GBM is sensitive to less energetic gamma rays than the Large Area Telescope, giving it a complementary view of the broad gamma-ray spectrum. Working together, the two instruments may finally unravel some of the knottiest mysteries of gamma-ray bursts.

"The past few decades have been a golden age for astronomy," says GBM principal investigator Chip Meegan of the Marshall Space Flight Center. Fermi, he believes, is going to keep the good times rolling. "I'm delighted to be a part of it."

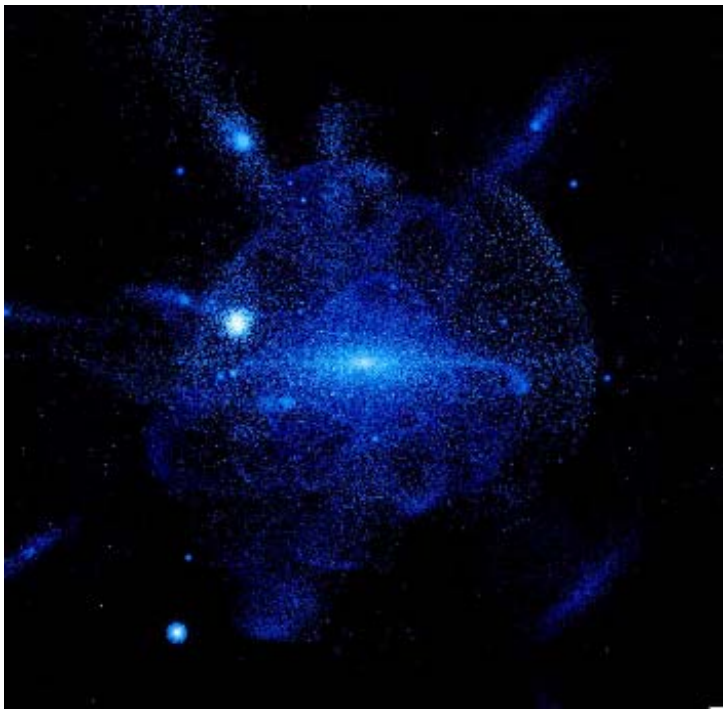


New Milky Way Map Reveals a Complicated Outer Galaxy

Sloan Digital Sky Survey Photo Release - August 18, 2008

CHICAGO -- The halo of stars that envelops the Milky Way galaxy is like a river delta criss-crossed by stellar streams large and small, according to new data from the Sloan Digital Sky Survey (SDSS-II). While the largest rivers of this delta have been mapped out over the last decade, analysis of the new SDSS-II map shows that smaller streams can be found throughout the stellar halo, said Kevin Schlaufman, a graduate student at the University of California at Santa Cruz.

Schlaufman reported his results at an international symposium in Chicago, titled "The Sloan Digital Sky Survey: Asteroids to Cosmology." Over the last three years, Schlaufmann explained, the SEGUE survey of SDSS-II has measured the motions of nearly a quarter million stars in selected areas of the sky. A careful search for groups of stars at the same velocity turned up 14 distinct structures, 11 of them previously unknown.



A theoretical model of a galaxy like the Milky Way, showing trails of stars torn from disrupted satellite galaxies that have merged with the central galaxy. The structures seen in the SDSS-II star maps support this prediction of a complicated outer Galaxy. The region shown is about one million light years on a side; the sun is just 25,000 light years from the center of the Galaxy and would appear close to the center of this picture. Credit: K. Johnston, J. Bullock

"Even with SEGUE, we are still only mapping a small fraction of the Galaxy," said Schlaufman, "so 14 streams in our data implies a huge number when we extrapolate to the rest of the Milky Way." If each velocity structure were a separate stream, Schlaufman explained, there would be close to 1,000 in the inner 75,000 light years of the Galaxy. However, these structures could arise from a smaller number of streams that are seen many times in different places.

"A jumble of pasta" is the way Columbia University researcher Kathryn Johnston described her theoretical models of the Milky Way's stellar halo. In a review talk at the symposium, Johnston explained how dwarf galaxies that pass close to the Milky Way can be stretched by gravitational tides into spaghetti-like strands, which wind around the Galaxy as stars trace out the same orbital paths at different rates.

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"In the center of the Galaxy, these stellar strands crowd together and you just see a smooth mix of stars," said Johnston. "But as you look further away you can start to pick out individual strands, as well as features more akin to pasta shells that come from dwarfs that were on more elongated orbits. By looking at faint features, Kevin may be finding some of the 'angel hair' that came from smaller dwarfs, or ones that were destroyed longer ago."

Heidi Newberg of Rensselaer Polytechnic Institute and her thesis student Nathan Cole have been trying to follow some of the larger strands as they weave across the sky. "It's a big challenge to piece things together," said Cole, "because the stream from one dwarf galaxy can wrap around the Galaxy and pass through streams of stars ripped from other dwarf galaxies."

Toward the constellation Virgo, where SDSS images revealed an excess of stars covering a huge area of sky, Newberg finds that there are at least two superposed structures, and possibly three or more. The SEGUE velocity measurements can separate systems that overlap in sky maps, Newberg explained in her symposium talk. "Part of what we see toward Virgo is a tidal arm of the Sagittarius dwarf galaxy, whose main body lies on the opposite side of the Milky Way, but we don't know the origin of the other structures. There really aren't enough pasta varieties to describe all the structures we find."

In addition to stellar streams, astronomers searching the SDSS data have found 14 surviving dwarf companions of the Milky Way, including two new discoveries announced today at the symposium by Gerard Gilmore of Cambridge University. These satellite galaxies are orbiting within the halo of invisible dark matter whose gravity holds the Milky Way itself together. Most of them are much fainter than the ten satellites known prior to the SDSS.

Because even the SDSS can only detect these ultra-faint dwarfs if they are relatively nearby, there could be several hundred more of them further out in the Milky Way's dark halo, according to independent analyses by graduate students Sergey Koposov, of the Max Planck Institute for Astronomy in Heidelberg, Germany, and Eric Tollerud, of the University of California at Irvine. "Even so," said Koposov, "we expect that the number of dark matter clumps is much larger than that, so something must prevent the smaller clumps from gathering gas and forming stars."

The SDSS dwarfs have far fewer stars than the previously known satellites, noted Gilmore, but they have similar spatial extents, and the stars within them move at similar speeds. "I think the internal dynamics of these tiny galaxies may be hard to explain with our conventional ideas about dark matter," said Gilmore.

"The SDSS has taught us a huge amount about the Milky Way and its neighbors," said Johnston, who is pleased to see some of the predictions of her models confirmed by the new data. "But we're still just beginning to map the Galaxy in a comprehensive way, and there's a trove of discoveries out there for the next generation of surveys, including the two new Milky Way surveys that will be carried out in SDSS-III."

The Sloan Digital Sky Survey is the most ambitious survey of the sky ever undertaken, involving more than 300 astronomers and engineers at 25 institutions around the world. SDSS-II, which began in 2005 and finished observations in July, 2008, is comprised of three complementary projects. The Legacy Survey completed the original SDSS map of half the northern sky, determining the positions, brightness, and colors of hundreds of millions of celestial objects and measuring distances to more than a million galaxies and quasars. SEGUE (Sloan Extension for Galactic Understanding and Exploration) mapped the structure and stellar makeup of the Milky Way Galaxy. The Supernova Survey repeatedly scanned a stripe along the celestial equator to discover and measure supernovae and other variable objects, probing the accelerating expansion of the cosmos. All three surveys were carried out with special purpose instruments on the 2.5-meter telescope at Apache Point Observatory, in New Mexico.

Cosmic Voids Were Emptied by Gravity

Sloan Digital Sky Survey News Release - August 17, 2008

CHICAGO - The largest 3-dimensional maps of the universe show that galaxies lie in filamentary superclusters interlaced by vast zones of emptiness, cosmic voids tens of millions of light years across that contain few or no bright galaxies. Researchers analyzing the two largest maps, from the Sloan Digital Sky Survey (SDSS-II) and the Two-Degree Field Galaxy Redshift Survey (2dFGRS), have concluded that these voids are also missing the "halos" of invisible dark matter that bright galaxies reside in.

"Astronomers have wondered for a quarter-century whether these voids were 'too big' or 'too empty' to be explained by gravity alone," said University of Chicago researcher Jeremy Tinker, who led the new study. "Our analysis shows that the voids in these surveys are exactly as big and as empty as predicted by the 'standard' theory of the universe."

Tinker presented his findings today at an international symposium in Chicago, titled "The Sloan Digital Sky Survey: Asteroids to Cosmology." A paper detailing the analysis will appear in the September 1 edition of The Astrophysical Journal, with the title "Void Statistics in Large Galaxy Redshift Surveys: Does Halo Occupation of Field Galaxies Depend on Environment?"

A central element of the standard cosmological theory, Tinker explained, is cold dark matter, which exerts gravity but does not emit light, and which accounts for more than 80 percent of the mass in the universe. Dark matter is smoothly distributed in the early universe, but over time gravity pulls it into filaments and clumps and empties out the spaces between them. Galaxies form when hydrogen and helium gas falls into collapsed dark matter clumps, referred to as "halos," where it can form luminous stars.

"We wanted to see whether something strange is happening to the dark matter halos in the regions where we don't see galaxies," said team member David Weinberg of Ohio State University. "Maybe the halos are there, but they just don't manage to form stars. Then the voids would look emptier than they really are, because they don't have anything our telescopes can see."

To address this question, the researchers first determined the relation between galaxies and dark matter halos by matching the galaxy clustering in dense regions -- the web of filamentary superclusters that interweaves the network of empty bubbles and tunnels. With this relation in hand, they used some of the world's largest supercomputer simulations to predict the number and sizes of voids.

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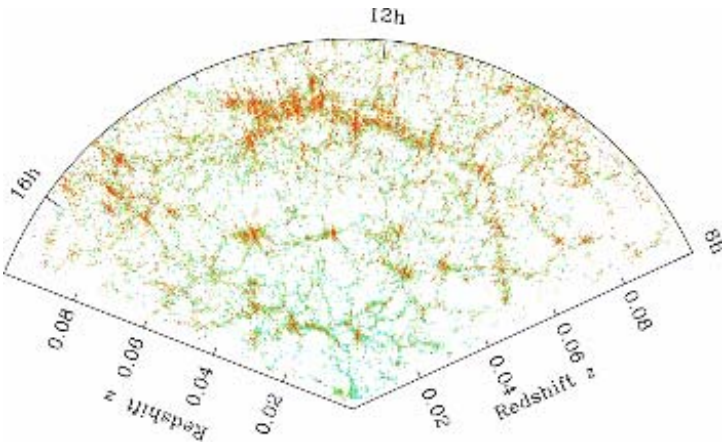

A map of the distribution of galaxies in a thin wedge on the sky, from the Sloan Digital Sky Survey (SDSS-II). The earth is at the vertex of the wedge, and the most distant objects shown are 1.3 billion light years away. Red points mark galaxies whose light is dominated by old stars, while blue points show galaxies with younger populations of stars. Galaxies are arrayed in clumps, filaments, and sheets, which are interweaved with bubbles and tunnels, the cosmic voids. The new study shows that these voids are empty of massive dark matter halos as well as luminous galaxies, and that the numbers and sizes of voids agree with theoretical models in which they grow by gravity starting from a smooth distribution of dark matter in the early universe. (Credit: M. Blanton and SDSS)

Princeton University graduate student Charlie Conroy measured the sizes of voids in the SDSS-II maps. "When we used galaxies brighter than the Milky Way to trace structure, the biggest empty voids we found were about 75 million light years across," said Conroy. "And the predictions from the simulations were bang-on."

The sizes of voids are ultimately set, Conroy explained, by the small variations in the primordial distribution of dark matter, and by the amount of time that gravity has had to grow these small variations into large structures. While studies from the 1990s showed that gravity could create large regions of low matter density, the new analysis shows that these regions should be truly empty of bright galaxies and the halos massive enough to host them, and that the theoretically predicted sizes agree precisely with observations.

Georgia Astronomy in State Parks (GASP) Events

The following are the GASP events scheduled for the remander of this year:

November 8 - Red Top Mountain State Park.

For more information about these events, contact Keith Burns at Keith_B@bellsouth.net or 770-427-1475.

The GASP volunteers at FDR State Park on Labor Day weekend 2004 - From left to right: Joanne Cirincione, Keith Burns, Harold and Claudia Champ with Ginger, Peter Macumber, Sharon Carruthers, Tom Faber, Kat Sarbell, and Holly and John Ritger. Photo by Holly Ritger.

Atlanta Astronomy Club Website

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 (when available) and other information. http://www.atlantaastronomy.org

The **Atlanta Astronomy Club, Inc**., the South's largest and oldest astronomical society, meets at **8:00 P.M.** on the third Friday of each month at Emory University's White Hall or occasionally at other locations or times. Membership is open to all. Membership fees are **$30 ($35)** for a family or single person membership. College Students membership fee is **$15 ($20)**. These fees are for a one year membership ($5 per year extra charge to receive the *Focal Point* mailed).

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.

AAC Officers and Contacts

President: Keith Burns 770-427-1475 Keith_B@bellsouth.net

Program Chair: Vacant programs@atlantaastronomy.org

Observing Chair: Dave Lumpkin observing@atlantaastronomy.org

Corresponding Secretary: Tom Faber 770-642-4865 focalpoint@atlantaastronomy.org

Treasurer: Sharon Carruthers Treasurer@AtlantaAstronomy.org

Recording Secretary: Rich Jakiel secretary@atlantaastronomy.org

Board Chair: Don Hall - Contact Info TBA

Board: Mark Banks - Contact Info TBA

Board: William Brannet - Contact Info TBA

Board: Marc Sandberg 404-531-4227 sandberg235@earthlink.net

Board: Larry Wallace - 770-888-3259 Larry@Wallace-Eng.com

ALCOR: Art Zorka 404-633-8822 (H) 404-824-7106 (C) star.myth@juno.com

Elliott Ch. Director: Theo Ramakers 770-464-3777 ramakers@bellsouth.net

Elliott Observing Supervisor: Jonathan Wood 404-374-8750 observing@ceastronomy.org

Elliott Recording Secretary: Ken Poshedly 678-516-1366 poshedly@bellsouth.net

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

Elliott Webmaster: Larry Owens 678-234-5399 webmaster@CEastronomy.org

The Telescope Workshop: Dan Llewellyn 404-735-9661 or 404-633-7562 zoser@mindspring.com

Georgia Astronomy in **State Parks:** Keith Burns 770-427-1475 Keith_B@bellsouth.net

Light Trespass: Marc Sandberg 404-531-4227 sandberg235@earthlink.net

AL Observing Programs Assistance: Keith Burns 770-427-1475 Keith_B@bellsouth.net

PSSG Chairman: Peter Macumber pmacumber@nightsky.org
Co-Chair: Joanne Cirincione starrynights@AtlantaAstronomy.org

Sidewalk Astronomy: Brad Isley sidewalkastronomy@atlantaastronomy.com

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

Webmaster Atlanta Astronomy: Peter Macumber 770-941-4640 pmacumber@nightsky.org

Directions to White Hall at Emory

Our meetings are generally held in a classroom in White Hall. To get to White Hall, turn onto Dowman Drive from North Decatur Road at the five way intersection (across from Everybody's Pizza). White Hall is located across from the new Science & Math building. Parking is available along Dowman Drive on both sides of the road. **The parking lot on the left behind the Admissions Building may be closed**. Additional parking is available in two parking decks near White Hall. For maps to the decks see http://map.emory.edu. For more detailed directions to Emory University, visit www.atlantaastronomy.org or go to the Emory web site.

The Focal Point

Newsletter of The Atlanta Astronomy Club, Inc.

FROM:
Tom Faber
2206 Treeridge Parkway
Alpharetta, GA 30022

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

Atlanta Astronomy Club
P.O. Box 76155
Atlanta, GA 30358-1155
www.atlantaastronomy.org

FIRST CLASS

Calendar by Tom Faber (All times EDT unless noted)

September 6th, Saturday: Mercury, Venus, Mars close together for next week.
September 7th, Sunday: Moon First Quarter.
September 10th, Wednesday: Mercury at Greatest Elongation East.
September 12th, Friday: Uranus Opposition.
September 15th, Monday: Full Moon.
September 19th, Friday: **AAC Meeting at White Hall, 8PM, Emory University.**
September 20th, Saturday: **Telescope & Instr Workshop - Contact Sharon Carruthers.**
September 22nd, Monday: Moon Last Quarter. Equinox at 11:44AM.
September 23rd, Tuesday: **Focal Point Deadline.**
September 27th, Saturday: **CEC Meeting - See pg 4 for details.**
September 28th, Sunday - October 5th, Sunday: Peach State Star Gaze!!!
September 29th, Monday: New Moon.
October 6th, Monday: Moon First Quarter.
October 10th, Friday: Bradley Open House, 8PM. See pg 4 for details.
October 14th, Tuesday: Full Moon.
October 17th, Friday: **AAC Meeting at White Hall, 8PM, Emory University.**
October 18th, Saturday: **Telescope & Instr Workshop - Contact Sharon Carruthers.**
October 20th, Monday: Moon Last Quarter.
October 21st, Tuesday: Orionid Meteors.
October 22nd, Wednesday: Mercury at Greatest Elongation West.
October 25th, Saturday: **CEC Meeting - See pg 4 for details.**
October 28th, Tuesday: New Moon.
November 5th, Wednesday: Moon First Quarter. Southern Taurid Meteors.
November 12th, Wednesday: Full Moon. Northern Taurid Meteors.
November 14th, Friday: **AAC Meeting at White Hall, 8PM, Emory University.**

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 Lenny Abbey.

Focal Point Deadline and Submission Information

Please send articles, pictures, and drawings in electronic format on anything astronomy 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 are okay. You can submit articles anytime up to and including the deadline date. **The October deadline is Tuesday, September 23rd at 4:00 PM. Submissions will not be accepted after the deadline.**