The Focal Point

The Atlanta Astronomy Club
Established 1947
February 2006

Vol XVIII No. 9

Editor: Kat Sarbell

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February General Membership Meeting

By Keith "Kosmic Kow" Burns

The next General meeting of the Atlanta Astronomy Club will be on February 10th at 8 P.M. at Emory University in White Hall. The room number is 207. Directions to White Hall are on page 7 of this newsletter. We will have refreshments in the hallway just outside the room before the meeting. A small donation in the kitty box is requested but not required.

The meeting starts at 8 PM. Note that this meeting is the second Friday of the month and not the third Friday like usual. We will have a business meeting first. This includes any announcements and other things of astronomical interest. I ask that anyone who wishes to make any announcements, please notify Philip Sacco via email at (president@atlantaastronomy.org) and also email me at Keith_B@Bellsouth.net. That way Philip knows who is speaking ahead of time and he can schedule the time. I need to know so I can put your information on a power point presentation slide that will run before and during the beginning of the business meeting.

Our featured speaker of the night, Adam Block, will give his talk with questions and answers to follow. We will adjourn the meeting and head off to a local eating establishment for supper, dessert, and/or just a drink.

Here's Adam's description of his talk: I will give my talk on the "Accessible Universe." It is a talk that combines my idea of the state of (amateur) CCD imagery with the kind of "stories" that the images can tell us. Today, no one is really attending to the kind of information that CCD observing can yield. People like Stephan O'Meara and Sue French actively describe the universe from a visual perspective. I enjoy giving this perspective from the viewpoint of a CCD Imager. The talk hits on issues that combine the story OF the image with the story IN the image. They are often both very compelling aspects. Also, I talk about my current plans for constructing my own observatory at a professional site.

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Remembering Bear

Published by Bear's family in The Atlanta Journal-Constitution on January 25, 2006.

Robert "Bear" Simmons, age 56, died January 21, 2006. Born in Jamestown , NY, Bear moved from Cassadaga , NY to Atlanta in the early 1970's. Bear was a master carpenter and a local musician (Bear and the Bobcats, Fulton Industrial Playboys, etc.), former president and member of the Atlanta Astronomy Club, and a Little League Coach. A songwriter, accomplished guitarist, lover of animals and all things outdoors, Bear leaves behind a son, R. William (Will) Simmons, a daughter, Jessica Lafoon Simmons, and a brother, William (Woody) Simmons, extended family and many friends.

Family and friends celebrated Bear's life at a private memorial service at Our Way Cafe in Avondale on Saturday, January 28, 2006.

Watch for an article celebrating the life of Bear and his contributions to the AAC in a future issue.

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I was born in Warwick, RI in '73. My family moved to Stone Mountain, Georgia when I was around 5 years old. As my interest grew, my parents took note and bought a toy-store refractor as my first telescope. In school I participated in special programs that emphasized science. It was at this time that I became involved in the activities of Fernbank Science Center.

After graduating from high school, I went to University of Arizona. As a freshman I volunteered at Flandrau Planetarium. Later I was hired to be a telescope operator for the 20-inch campus telescope at Steward Observatory.

I believe my first "successful" image with a CCD camera was of M57. The professor decided to purchase an ST6 camera and so began my imaging career.

I graduated with a B.S. in Astronomy and Physics. After work I would drive out to Benson, Arizona and work with guests of Sky watcher's Inn for Dr. Ed Vega.

In November '96 I found out that Kitt Peak was looking for someone to help run a new public observing program. For the next nine years I developed the "Advanced Observing Program" and began learning the intricacies of CCD imagery. From "Track and Accumulate" with the nearly blind early ABG ST7 to the ST10XME with an AO-7 through a 20in RCOS telescope, the journey was an exciting foray into instrumentation and astronomy.

Today I am trying to continue a career in this field by building an observatory and offering my own public programs (please see my website). It is only with support of family and friends that I will ultimately succeed. My beautiful wife, Miwa, continues to be the reason I am able pursue my second most personal passion, astronomy, as my first.

Adam's astrophotography images have appeared in magazines such as *Astronomy* and *Sky and Telescope*; in software including Starry Night and Kstars; in books like *The Caldwell Objects* by Stephen O'Meara; and on the Internet at APOD, Space.com, NASA, and JPL.

Plus Adam has made special appearances on TV either himself or his images including: Live Feed (Many Media Outlets) for July 4th, 2005 Deep Impact, The Today Show 2003 Mars Opposition with David Levy, and the American Museum of Natural History Astrophysics Exhibit (Jan 2002) NGC 5713.

March Speaker and Program

On March 17th Rich Jakiel will give the talk on ancient astronomical coinage that he gave at the PSSG. Of course, there is new information that he will include.

January General Membership Meeting

January 13, 2006
by Art Russell, Recording Secretary

Approximately 60 members and guests attended the October General Membership Meeting of the AAC held at Emory University's White Hall. Keith Burns, Vice President for Programs, opened the meeting at 8:05 PM.

AAC member Marc Sandberg briefly discussed the club's dark-sky initiatives and noted that DarkSkyGeorgia is now an official section of the International DarkSky Alliance. He stated the organizational meeting will be held shortly and that interested parties should contact him at darkskygeorgia@earthlink.net.

Art Zorka, Astronomical League Coordinator (ALCOR), announced member Art Russell's receipt of observing award and pin for the Astronomical League's (AL) Lunar Club. Art Zorka also noted that all AAC members receive the AL's newsletter, The Reflector by virtue of the club's membership in the AL. He asked that any member not currently receiving The Reflector contact him in order that he can take appropriate action.

AAC member Karen Stiles noted that the Vila Rica school system would like to set up a mentoring program focused around astronomy. If you are interested in participating in the program please contact Karen by email at: astrocycle@yahoo.com.

Peach State Star Gaze Co-Chairman Peter Macumber reported that the next PSSG would be held October 12-16, 2006. Although several interesting site alternatives have been suggested, this year's PSSG will be held at White Water, the site of the past several PSSGs.

Dark-Sky Committee Chairman Art Russell reported that the committee is currently engaged in negotiations to secure a Dark-Sky site for the club at Deerlick Astronomical Village (DAV) (see http://www.deerlickgroup.com/). He noted that securing a Dark-Sky site has been one of the most important goals of the club for the past 10 years. He further stated that DAV offers the best long-term solution to meet the club's goal. Art then discussed Carroll County's recently announced Blackjack Mountain initiative. He further noted, that unfortunately, Blackjack Mountain does not offer a near-term solution as Carroll County representatives appear to be planning optimistically in the 3 to 5 year time frame and have yet to address the significant costs that would be incurred in providing access to the site.

AAC member Art Russell then introduced the evening's speaker, Dr. David T. King, Jr., of Auburn University who discussed "Catastrophic cosmic impact in the southern Gulf of Mexico and its effects: the sedimentary record of the Cretaceous-Tertiary boundary in Belize, Mexico, and the US Gulf Coast (Plus the sedimentary layers in Italy)."

Keith Burns, Vice President for Programs, noted the next General Meeting of the AAC will be February 10, 2006 and will feature noted astrophotographer Adam Block. Keith then closed the meeting at 9:35 PM.

The Telescope & Instrument Workshop

by Sharon Carruthers

The next T&IW will be on Saturday, February 18th at 11:00 a.m. at Bradford Map & Telescopes. We are planning to purchase some cheap 6" mirrors to build Club "loaner" scopes. Also, looking for 6" - 8" blanks so we can grind our own. We are also looking for donations of supplies we can use to build scopes or old scopes that we can either refurbish or cannibalize for parts.

In March we will also meet on the 18th at the same time and location.

Location: Bradford Map, Globe & Telescopes, 300 Hammond Dr, Sandy Springs 30328

For More infomation, contact: Dan Llewellyn at zoser@mindspring.com or 404-633-7562; or Sharon Carruthers at Treasurer@AtlantaAstronomy.org or 404-843-9610

Charlie Elliott January Meeting

by Clevis Jones, CEC Recording Secretary

Saturday January 21, 2006

ATTENDANCE: Seventeen guests and members attended the January meeting held at the Charlie Elliott Visitor Center.

BUSINESS: Chapter Director, Larry Owens, began the meeting with an overview and history of the Byers mount project. The operational Byers mount with a 16-inch Newtonian attached was proudly, and due to its huge size, prominently displayed for all to see and touch. All agreed Larry should attach an emblem stating "OWENS / BYERS MOUNT, sn 001". Thanks to all who have contributed equipment, time, effort, and money to the project! And, there are a few more tweaks to come.

[CEC Recording Secretary note: the Byers mount project is a club mount/project. Larry has spent several hundred hours, a lot of sweat (it's HEAVY), and more than three hundred dollars on the superb restoration. He is also taking the lead on the 16-inch Truss-Tube project. If you would care to donate to help defray costs, contact Larry Owens at planetographer@comcast.net]

Larry also demonstrated and explained the CEC Web site changes he has made: explore "What's New" beginning here: http://www.atlantaastronomy.org/CEWMA/

OBSERVING REPORT - What's Up Tonight: Steve Bieger presented "What's Up Tonight" with a theme of "Open Clusters". This month is the Wolf Moon. January 23rd around 6-7 a.m. (0600-0700 on the 24 hour clock) the moon will be near Jupiter. Saturn opposition occurs on the 27th. Of particular interest was information covering Harlow Shapely (1885-1972) and Robert Trumpler (1886-1956) and the classification of open clusters: informative and interesting.

CURRENT EVENTS REPORT: Clevis Jones deferred coverage of the return of STARDUST and the launch of NEW HORIZONS to the feature program he presented this month.

FEATURED PROGRAM "A Long Time Ago …": Clevis presented a slide show introduction to astronomy and how a lot of astronomy relates to circles: from the 24-hour clock to the celestial sphere and its grid system, to your circle of astronomy friends. Also touched on were basic telescope and mount types supplemented with input from all those present that cared to comment. Larry Owens covered the kinds of astro-imaging equipment available. Clevis then covered some useful to know facts about day and night vision. He wrapped up his presentation by inviting all to mingle and ask questions of the astronomers who had brought their telescopes. Touching and talking about the telescopes, mounts, and cameras were the main event – thanks to all who brought equipment (Larry Owens, Steve Bieger, Ken Poshedly, Bud Sosebee, Crystal Watson, Jonathan Wood, Clevis & Debbie Jones). Questions and comments went on for a couple of hours – everyone had a good time at the CEC astronomy equipment expo.

OBSERVING SESSION: No observing due to overcast.

Future Charlie Elliott Chapter Meetings

February 18, 2006 - 3:00 p.m. at the Charlie Elliott Visitor's Center

-Astronomy Current Events - Clevis Jones

-What's Up Tonight - Steve Bieger

Feature Program: - no feature program is scheduled – our hope is the sky will cooperate for some observing at the CE field!

Upcoming meeting dates: Mar 25, Apr 22, May 20, Jun 17, Jul 15, Aug 19, Sep 16, Oct 14, Nov 11, Dec 09.

FOR UPDATES & DIRECTIONS: PLEASE check the CEC website for current meeting information! http://www.atlantaastronomy.org/CEWMA/

AAC Board of Directors Meeting

December 11, 2005, by Art Russell, Recording Secretary

General. Chairman of the Board, Tom Crowley, opened the meeting of the Board of Directors (BOD) at 5:05PM. Members attending were Art Russell, Art Zorka, Chris Hetlage, Kat Sarbell, Keith Burns, Ken Poshedly, Larry Owens, Peter Macumber, Sharon Carruthers, Tom Crowley, and Tom Faber. **The following actions were decided during the meeting: (1)** The BOD agreed that the Focal Point should remain in its current form. **(2)** The Dark-Sky Committee will report its recommendation on purchase of property at Deerlick Astronomical Village (DAV) at the next meeting of the BOD. **(3)** Treasurer Sharon Carruthers was asked to post a message to the AAC list asking committees to identify their upcoming budgetary needs. **(4)** President Philip Sacco was asked to present his proposal to revise membership dues structure to the BOD at its next meeting. **(5)** Sharon Carruthers was asked to post a message to the AAC list to provide a sensing of the membership's thoughts about a single yearly renewal date. **(6)** Sharon Carruthers was also asked to query the membership at each of the next three General Meetings to provide a sensing of the membership's thoughts about a single yearly renewal date as well. **(7)** The BOD decided that the AAC shall use PayPal as an option for paying dues and PSSG fees. **(8)** Art Zorka was asked to extend his survey of member interest in participation in Special Interest Groups to include the AAC list and report the results back at the next BOD meeting. **(9)** On the issue of establishing a North Georgia chapter of the AAC, Ken Poshedley volunteered to ask *Sky & Telescope* for the cost of mailing labels of amateur astronomers receiving *S & T* centered on north Georgia zip codes. The BOD asked him to provide mailing labels to Philip. **(10)** The BOD asked Peter Macumber to provide Philip with names of members residing in north Georgia. **(11)** The BOD asked Philip Sacco to create an Advertising Committee and identify chairman. **(12)** The BOD asked Philip Sacco to investigate the need and opportunity for a "new member social."

Agenda Items: Focal Point - Philip Sacco. Discussed was changing the current Focal Point format from that currently using two columns per page to a format using one column per page. **AAC and DAV** - Philip Sacco. Discussed was the need to define the mission for the committee. Also discussed was the need to return a proposal to the BOD as soon as possible in order to secure the best possible location and relationship for the AAC with DAV. Committee members: Philip Sacco, Tom Crowley, Peter Macumber, Alex Langoussis, Dan Llewellyn, Joanne Cirincione. **Fund Raising** - Philip Sacco. Discussed were possible approaches that might be taken in soliciting funds: Different levels of club membership with differing levels of participatory rights, individual contributions, NASA Ideas Grants, corporate sponsorship or membership, corporate grants, and matching contributions from employers. Chris Hetlage agreed to serve on the Fund Raising Committee, but is unable to serve as chairman. **CEC Mirror** - Larry Owens. The CEWMA Chapter 16-inch mirror has been sent to Galaxy Optical for refiguring and recoating with a 96% reflectance surface. Expected return delivery date is Feb.1, 2006. Larry also reported that he had purchased the Celestron NexImager for video imaging as approved at the last BOD meeting. **2006 - 2007 Budget** - Sharon Carruthers observed that membership and income is down from last year. She asked that committees let her know their budgetary needs for the upcoming 2006-2007 budget. **AAC Training** - Philip Sacco reported that the AAC Training Program proponent has not yet presented his plan for comment and approval. **AL Observing Programs** - Keith Burns is in the process of consolidating AL observing club info on a single CD for use by AAC members. **Dues** - Philip Sacco requested membership and treasurer files in order to support his proposal of a revision of AAC dues. He wishes to consider membership income compared to expenses. **Five-Year Plan** - Philip Sacco reported that some current club activities already meet the 5-Year Plan. These include the initiative to secure a Dark-Sky site at the DAV and purchase of a Celestron NexImager for video imaging.

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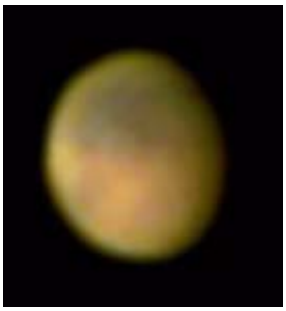
Woodruff - Philip Sacco. No one has been identified at this time to provide support for 2006 AAC educational activities at Woodruff. **Boy Scout Liaison** - Philip Sacco was asked to confirm the identification of a new Boy Scout Liaison for Woodruff. **Membership Renewal Date** - Art Zorka suggested that the current system of membership renewal places an unnecessary burden on the club treasurer. **Nominating Committee** - Philip Sacco announced that Don Hall and Art Zorka had agreed to serve on the committee. **PayPal** - Peter Macumber discussed the use of PayPal to facilitate payment of dues and PSSG fees. **Special Interest Group**. Art Zorka reviewed the results of a survey completed during the most recent General Meeting of the AAC about member interest in special interest groups. Responding members were interested in the following special interest groups: Beginner Astronomy, Planetary Astronomy, Messier Objects, and Quantum Physics. Chris Hetlage suggested that Astronomical Imaging be accepted as a de facto special interest group based upon the interest demonstrated among club members on the AAC list and AtlantaAstroImaging group. **Woodruff (Blue Ridge)** - Philip Sacco. Progress has not been made on establishing a north Georgia chapter of the AAC. Discussed was whether or not establishing an AAC chapter in north Georgia would meet a perceived need for amateur astronomy that is not currently being met by the North Georgia Astronomy Club of Gainesville, GA (http://northgeorgiaastronomers.org/webpage/index1.htm). **Membership Packets** - Sharon Carruthers reported that she has updated the membership application form and currently sends membership packets to new members when they first join the club. **PSSG** - Peter Macumber. Net profit from the 2005 PSSG was about $1200. During discussion of the PSSG, Philip suggested consideration of CEWMA as a site for the 2006 PSSG, pending negotiations with the DAV. Tentatively, the 2006 PSSG will occur October 16-22, 2006. Peter will conduct a "post mortem" of this year's PSSG during the week of 12-16 December 2005.

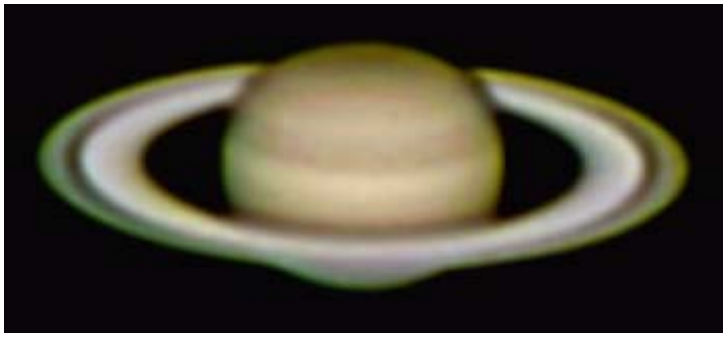
New Business: Club Advertising - Philip Sacco is concerned the AAC is not well advertised in Atlanta. He is looking for a committee chair to head. **New Member Social** - Philip Sacco suggested there is a need for a new member social to provide an opportunity for new members to meet the older members of the club.

Next Board Meeting. February 12 at 5PM.

Saturn image by Rich Jakiel. 2/1/06 at 0248 UT. 12 inch LX200 at f/20, NexImage cam - 1350 frames. Seeing 4(10), D = 20.4", Tilt = -19.0, Sys III = 103.06 degrees.

Mars image by Rich Jakiel. 2/1/06 at 0109 UT. 12 inch LX200 at f/20, NexImage cam 3000 frames. Seeing very poor 2 (10). CM = 95.6, D = 8.80", Phase = 0.893.





Saturn image by Rich Jakiel. 2/1/06 at 0258 UT. 12 inch LX200 at f/20, NexImage cam - 2200 frames at 24 fps. Seeing 4(10), D = 20.35", Tilt = -19.02, Sys III = 109.0 degrees.

Two Exiled Stars Are Leaving Our Galaxy Forever

Harvard-Smithsonian Center for Astrophysics Release - January 26, 2006

Cambridge, MA - TV reality show contestants aren't the only ones under threat of exile. Astronomers using the MMT Observatory in Arizona have discovered two stars exiled from the Milky Way galaxy. Those stars are racing out of the Galaxy at speeds of more than 1 million miles per hour - so fast that they will never return.

"These stars literally are castaways," said Smithsonian astronomer Warren Brown (Harvard-Smithsonian Center for Astrophysics). "They have been thrown out of their home galaxy and set adrift in intergalactic space."

Brown and his colleagues spotted the first stellar exile in 2005. European groups identified two more, one of which may have originated in a neighboring galaxy known as the Large Magellanic Cloud. The latest discovery brings the total number of known exiles to five.

"These stars form a new class of astronomical objects - exiled stars leaving the Galaxy," said Brown.

Astronomers suspect that about 1,000 exile stars exist within the Galaxy. By comparison, the Milky Way contains about 100 billion stars, making the search for exiles much more difficult than finding the proverbial "needle in a haystack." The Smithsonian team improved their odds by preselecting stars with locations and characteristics typical of known exiles. They sifted through dozens of candidates spread over an area of sky almost 8000 times larger than the full moon to spot their quarry.

"Discovering these two new exiled stars was neither lucky nor random," said astronomer Margaret Geller (Smithsonian Astrophysical Observatory), a co-author on the paper. "We made a targeted search for them. By understanding their origin, we knew where to find them."

Theory predicts that the exiled stars were thrown from the galactic center millions of years ago. Each star once was part of a binary star system. When a binary swings too close to the black hole at the galaxy's center, the intense gravity can yank the binary apart, capturing one star while violently flinging the other outward at tremendous speed (hence their technical designation of hypervelocity stars).

The two recently discovered exiles both are short-lived stars about four times more massive than the sun. Many similar stars exist within the galactic center, supporting the theory of how exiles are created. Moreover, detailed studies of the Milky Way's center previously found stars orbiting the black hole on very elongated, elliptical orbits - the sort of orbits that would be expected for former companions of hypervelocity stars.

"Computer models show that hypervelocity stars are naturally made near the galactic center," said theorist Avi Loeb of the Harvard-Smithsonian Center for Astrophysics. "We know that binaries exist. We know the

galactic center holds a supermassive black hole. So, exiled stars inevitably will be produced when binaries pass too close to the black hole."

It is estimate that a star is thrown from the galactic center every 100,000 years on average. Chances of seeing one at the moment of ejection are slim. Therefore, the hunt must continue to find more examples of stellar exiles in order to understand the extreme environment of the galactic center and how those extremes lead to the formation of hypervelocity stars.

The characteristics of exiled stars give clues to their origin. For example, if a large cluster of stars spiraled into the Milky Way's central black hole, many stars might be thrown out at nearly the same time. Every known hypervelocity star left the galactic center at a different time, therefore there is no evidence for a "burst" of exiles.

Hypervelocity stars also offer a unique probe of galactic structure. "During their lifetime, these stars travel across most of the Galaxy," said Geller. "If we could measure their motions across the sky, we could learn about the shape of the Milky Way and about the way the mysterious dark matter is distributed."

The first newfound exile, in the direction of the constellation Ursa Major, is designated SDSS J091301.0+305120. It is traveling out of the galaxy at a speed of about 1.25 million miles per hour and currently is located at a distance of about 240,000 light-years from the earth. The second exile, in the direction of the constellation Cancer, is designated SDSS J091759.5+672238. It is moving outward at 1.43 million miles per hour and currently is located about 180,000 light-years from the earth.

Both stars, although traveling at tremendous speeds through space, are located so far from the earth that their motion cannot be detected except with sophisticated astronomical instruments.

This research has been submitted to The Astrophysical Journal Letters for publication and is available online at http://arxiv.org/abs/astro-ph/0601580. Authors on the paper are Brown, Geller, Scott Kenyon and Michael Kurtz (Smithsonian Astrophysical Observatory).

Headquartered in Cambridge, Mass., the Harvard-Smithsonian Center for Astrophysics (CfA) is a joint collaboration between the Smithsonian Astrophysical Observatory and the Harvard College Observatory. CfA scientists, organized into six research divisions, study the origin, evolution and ultimate fate of the universe.

New Horizons - The PI's Perspective

by Alan Stern

(From http://pluto.jhuapl.edu)

Our Aim Is True - January 31, 2006

New Horizons is nearing completion of its second week in flight, and all continues to go well. As Project Manger Glen Fountain is proud of saying, New Horizons is now safely away from Earth, in the cold vacuum she was born to thrive in.

In the past week, our spacecraft team, led by Alice Bowman and Nick Pinkine at the Johns Hopkins Applied Physics Laboratory, continued their checkouts of spacecraft subsystems, and conducted Trajectory Correction Maneuver (TCM) 1 with great success. As a result, the error in New Horizons' trajectory, which was already small, has been reduced by a factor of almost 20!

The purpose of TCM-1 was both to commission our propulsion system for trajectory changes, and to null out launch injection errors. Fortunately, our launch was so accurate that only about 40 miles per hour of trajectory change needed to be made; this is less than one quarter of our post-launch trajectory correction budget. Compare that 40 miles/hour number to our 36,254 mile-per-hour exit from Earth, and you'll see just how fantastic a job our Atlas V/STAR-48 launcher did. This allows us to bank the

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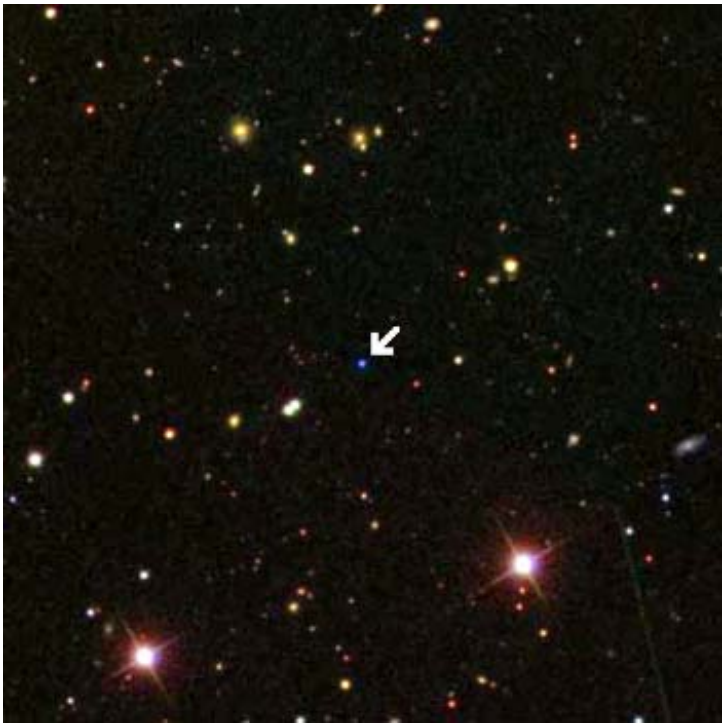
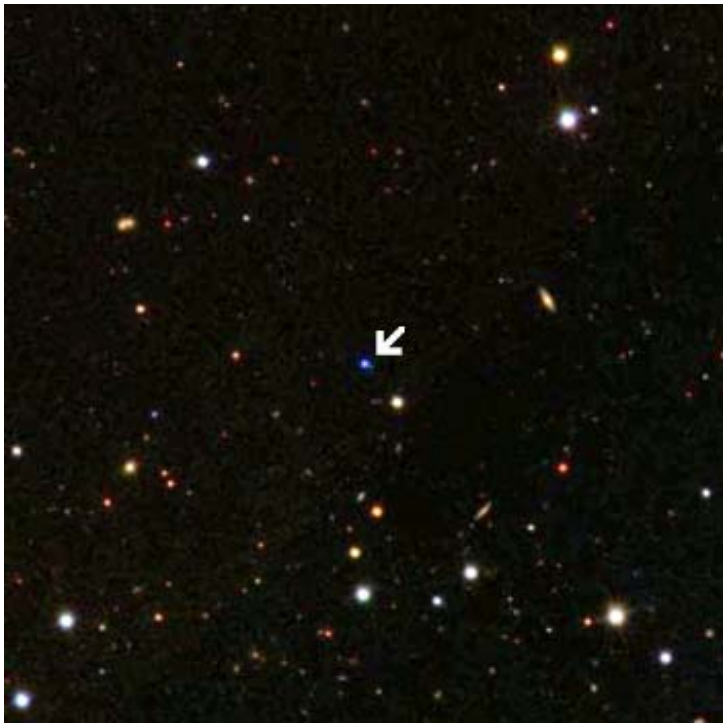
Below left: This photograph from the Sloan Digital Sky Survey shows one of two newly discovered hypervelocity stars (marked with an arrow). SDSS J091301.0+305120 is traveling out of the galaxy at a speed of about 1.25 million miles per hour and currently is located at a distance of about 240,000 light-years from the earth. This image is about 7 arcminutes on a side, showing an area of the sky about 1/15 the size of the Full Moon. Credit: SDSS Collaboration (www.sdss.org)

Below right: This photograph from the Sloan Digital Sky Survey shows the second of two newly discovered hypervelocity stars (marked with an arrow). SDSS J091759.5+672238 is moving outward at 1.43 million miles per hour and currently is located about 180,000 light-years from the earth. This image is about 7 arcminutes on a side, showing an area of the sky about 1/15 the size of the Full Moon. Credit: SDSS Collaboration (www.sdss.org)





difference in fuel as savings for future Jupiter, Pluto and Kuiper Belt Object encounters.

TCM-1 was split into two parts, called 1A and 1B. TCM-1A was a 5 meter/second test and calibration firing conducted on Saturday, January 28; TCM-1B was a 13.3 meter/second maneuver conducted on Monday, January 30. Both maneuvers were successful. We plan to trim out the small (about 4%) residuals from the two TCM-1 burns, and to correct to the much better orbit solution we will have from another couple of weeks of tracking by the Deep Space Network (DSN) in TCM-2. This burn, which is likely to be the smallest of the three post-launch maneuvers, is scheduled for Wednesday, February 15.

TCM 1A and 1B were conduced "open loop," by pointing the spacecraft in the correct direction for the burn, stabilizing it like a spinning top, and making a timed burn. In contrast, TCM-2 will be conducted in "closed loop" fashion, with the spacecraft three-axis stabilized and using its onboard gyros in the loop to cut the burn off when the precise targeted velocity change (Delta V) is achieved. As such, TCM-2 should produce an even closer-to-spec burn than TCMs 1A and 1B. As you can see, we wanted to "walk before we ran" in terms of TCM complexity, which is why TCM-1 used the simpler but less accurate technique described above.

As we gain flight experience with our spacecraft, we are coming up the learning curve and seeing some of its idiosyncrasies. This is something all spacecraft teams benefit from in early flight. For example, careful tracking has shown that New Horizons is still slowly outgassing some absorbed water it took on during its construction and testing on Earth. This outgassing produces tiny puffs of gas from time to time, particularly when a spacecraft surface that has only been in shadow is exposed to sunlight, which vaporizes the water in it. Although the forces at work due to water vaporization events are incredibly tiny, less than 10-7 Gs, we are able to detect them from tracking data. Another idiosyncrasy we are seeing is a few radiation-induced single-bit upsets in the spacecraft memory each day. Although these are occurring at a somewhat higher than predicted rate, they are no problem and are corrected automatically onboard the spacecraft when it does its once-per-minute memory scrubs.

Liftoff of the Atlas V carrying NASA's New Horizons spacecraft to a distant date with Pluto! Image credit: NASA/KSC

For those of you interested in the question "Where is New Horizons?" -- our Web site now has a feature (http://pluto.jhuapl.edu/mission/whereis_nh.php) that gives you both graphical location and trajectory displays, some distances to Earth, Jupiter, and Pluto, and other information too. As I write these words, the spacecraft has just passed the 12-million kilometer range from Earth. Enjoy!

For those of you interested in our now-derelict third stage, we decided not to include it in the "Where is New Horizons?" feature, but I can tell you that orbit extrapolations tell us that our third stage is now about 15,000 kilometers from New Horizons. By the time it reaches Jupiter, the defunct stage will be about 400,000 kilometers away from our spacecraft. Owing to it missing the Pluto aim point at Jupiter by this amount, the third stage will miss Pluto by about 200 million kilometers — which is about as far as the average distance from the Sun to Mars.

Finally, for this week, I'll remind you that February 4 is the 100th anniversary of the birth of Clyde Tombaugh, the discoverer Pluto.

New Horizons Science Payload

Spacecraft instruments are selected to meet a mission's science goals. On New Horizons, for example, NASA set out a list of things it (and the planetary science community) wanted to know about Pluto: What is its atmosphere made of, and how does it behave? What does the surface of Pluto look like? Are there big geological structures? How do particles ejected from the Sun (known as the solar wind) interact with Pluto's atmosphere?

The New Horizons team selected instruments that not only would directly measure NASA's items of interest, but also provide backup to other instruments on the spacecraft should one fail during the mission.

The payload includes seven instruments:

Ralph's main objectives are to obtain high resolution color maps and surface composition maps of the surfaces of Pluto and Charon. The instrument has two separate channels: the Multispectral Visible Imaging Camera (MVIC) and the Linear Etalon Imaging Spectral Array (LEISA). A single telescope with a 3-inch (6-centimeter) aperture collects and focuses the light used in both channels.

Alice is an ultraviolet imaging spectrometer that will probe the atmospheric composition of Pluto. A "spectrometer" is an instrument that separates light into its constituent wavelengths, like a prism, only better. An "imaging spectrometer" both separates the different wavelengths of light and produces an image of the target at each wavelength.

REX is an acronym for "radio experiment," - it is really just a small printed circuit board, containing sophisticated electronics, integrated into the New Horizons radio telecommunications system. All communication with New Horizons, including the downlink of science data, takes place through the radio package, which makes it critical to mission success.

The instrument that provides the highest spatial resolution on New Horizons is LORRI - short for Long Range Reconnaissance Imager - which consists of a telescope with a 8.2-inch (20.8-centimeter) aperture that focuses visible light onto a charge coupled device (CCD). LORRI has a very simple design; there are no filters or moving parts. Near the time of closest approach, LORRI will take images of Pluto's surface at football-field sized resolution, resolving features approximately 100 yards or 100 meters across.

The Solar Wind Analyzer around Pluto (SWAP) instrument will measure charged particles from the solar wind near Pluto to determine whether Pluto has a magnetosphere and how fast its atmosphere is escaping.

Another plasma-sensing instrument, the Pluto Energetic Particle Spectrometer Investigation (PEPSSI), will search for neutral atoms that escape

Continued on next page

Pluto's atmosphere and subsequently become charged by their interaction with the solar wind.

The last scientific instrument on New Horizons is an Education and Public Outreach project. The Student Dust Counter (SDC) will count and measure the sizes of dust particles along New Horizons' entire trajectory, which covers regions of interplanetary space never before sampled. Such dust particles are created by comets shedding material and Kuiper Belt Objects colliding with one another. The SDC is managed and was built primarily by students at the University of Colorado in Boulder, with supervision from professional space scientists.

Georgia Astronomy in State Parks (GASP) Events

Here are the currently scheduled upcoming GASP events:

March 25th - Unicoi St Park.

April 15th - Tallulah Gorge St Park

September 2nd - FDR State Park (Labor Day Weekend)

November 11th - Florence Marina St Park.

For more information about these events, contact Joanne Cirincione at Starrynights@AtlantaAstronomy.org.

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

Next AAC Board Meeting

The next Board Meeting of the Atlanta Astronomy Club will be on Sunday, February 12th at 5:00PM at Bradford Map, Globe & Telescopes, 300 Hammond Dr, Sandy Springs.

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** for a family or single person membership. College Students membership fee is **$15**. These fees are for a one year membership.

Magazine subscriptions to ***Sky & Telescope*** or ***Astronomy*** can be purchased through the club for a reduced rate. The fees are **$33** for Sky & Telescope and **$34** for Astronomy. Renewal forms will be sent to you by the magazines. Send the renewal form along with your check to the Atlanta Astronomy Club treasurer.

The Club address: Atlanta Astronomy Club, Inc., P.O. Box 76155, Atlanta, GA 30358-1155.

Atlanta Astronomy Club Hot Line: Timely information on the night sky and astronomy in the Atlanta area. Call **770-621-2661**.

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 Contacts

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Elliott Observing Supervisor: Steve Bieger - Contact Info TBA

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Woodruff Observ. Coordinator: John Lentini 770-984-0175 johnlentini@yahoo.com

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

Directions to White Hall at Emory

Meeting Location Information:

Turn onto Dowman Drive from North Decatur Road at the five way intersection (across from Everybody's Pizza). White Hall is located on the right across from the new Science & Math building. Parking is available along Dowman Drive on both sides of the road. There is also a gated parking lot on the left behind the Admissions Building. After 6PM there is no fee to park there. For more detailed directions on how to get to Emory University, visit www.atlantaastronomy.org.

Calendar by Tom Faber (All times EST unless noted)

February 5th, Sunday: Moon First Quarter, near Mars. Neptune Conjunction with Sun.

February 10th, Friday: **(Special Date)** AAC Meeting at White Hall, 8PM, Emory University. Bradley Observatory Open House, 8PM, Agnes Scott College, "The fault, dear Brutus, is not in our stars / But in ourselves. Was Cassius Right?" Mark Douglas (Columbia Seminary).

February 12th, Sunday: AAC Board Meeting, 5PM. Moon Full (Snow, Hunger, or Wolf Moon).

February 17th, Friday: Moon occults Spica.

February 18th, Saturday: Telescope & Instrument Workshop, 11:00 a.m. at Bradford Map & Telescopes. CEC Meeting, 3PM.

February 21st, Tuesday: Moon Last Quarter.

February 23rd, Thursday: Mercury Greatest Eastern Elongation.

February 25th, Saturday: DSO at Woodruff BSC, Contact Daniel Herron for details.

February 27th, Monday: New Moon.

March 1st, Wednesday: Uranus Conjunction with Sun.

March 6th, Monday: Moon First Quarter.

March 10th, Friday: Bradley Observatory Open House, 8PM, Agnes Scott College, Equinox Concert and Planetarium Show.

March 14th, Tuesday: Moon Full (Sap, **Crow**, or Lenten Moon).

March 17th, Friday: AAC Meeting at White Hall, 8PM, Emory University.

March 18th, Saturday: Telescope & Instrument Workshop, 11:00 a.m. at Bradford Map & Telescopes.

March 20th, Monday: Vernal Equinox at 1:26PM.

March 22nd, Wednesday: Moon Last Quarter.

March 25th, Saturday: Venus at Greatest Western Elongation. GASP at Unicoi State Park. Zombie party & Messier Marathon - Date Tentative, Contact Daniel Herron for details. CEC Meeting, 3PM.

March 26th, Sunday: Venus near Neptune.

March 29th, Wednesday: New Moon.

Atlanta Astronomy Club Listserve

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 Info

Please send articles, pictures, and drawings in electronic format on anything astronomy related to Kat Sarbell at focalpoint@atlantaastronomy.org. You can submit articles anytime up and including the deadline date. **The deadline for March is Thursday, February 23rd at 4:00 PM .... Submissions will no longer be accepted after the deadline**.

ATLANTA ASTRONOMY CLUB EST. 1947

The Focal Point

Newsletter of The Atlanta Astronomy Club, Inc.

FROM:

Kat Sarbell

2025 Peachtree Road, Apt.#408

Atlanta, GA 30309

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

Atlanta Astronomy Club

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Atlanta, GA 30358-1155

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