

The Focal Point

The Atlanta Astronomy Club
Established 1947
April 2008

Vol. 20 No. 11

Editor: Kat Sarbell

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April Meeting Special Announcement

by the Editor and Keith "Kosmic Kow" Burns

I just wanted to give everyone a heads up on the April meeting. The date is April 18th, 2008 at 8 PM. Unlike the others meetings we hold, this one is very special. Emory University and the Atlanta Astronomy Club have extended a invitation to Jeff Hester of Arizona State University to come speak. Jeff has graciously accepted the offer. Anyone who follows Hubble Space Telescope pictures and news will know who he is. Jeff helped design the instrument they used to fix Hubble's bad mirror. His name is also attached to some of the biggest Hubble Space Telescope images. The Pillars of Creation a/k/a M16 is one of his pictures. There are others but I don't want to spoil the talk.

On April 18th we are holding our meeting in room 208 instead of room 207. This is because Emory has invited many others in the community to come and see him. So if you want to come, please come early. Room 207 is the overflow room for those who do not come early enough to get a seat in room 208. They will have video feed to room 2007. Plus Jeff will come over to the overflow room before hand to visit with everyone for a few minutes before the meeting starts. All club members are invited and encouraged to come. So please come if you can.

We are suspending our usual program for the evening. The Astronomical League feature and the Nothing to See feature will be back in living color for the May meeting. Before the April meeting starts, we will have the announcements power point running on the big screen for all to see. A special power point is forth coming for this event. I can't tell you anymore right now. You will have to come and find out more.

The program has come about because of the help and work of Rick Williamon, Alex Langoussis, and Keith Burns. I want to especially give a big thank you to Rick Williamon for his hard work in making this happen. From time to time, we will have special meetings like this when possible.

Speaker Biography

Jeff Hester, Professor of Astronomy in the School of Earth & Space Exploration, Arizona State University Jeff Hester received his PhD in Space Physics and Astronomy from Rice University in 1985, and from there took a position at Caltech working with the *Hubble Space Telescope*. Following the discovery of the flaw in *Hubble's* mirror, Dr. Hester joined the team of scientists responsible for giving *Hubble* a new life, and allowing it to fulfill its promise of ground-breaking discoveries. Today, Dr. Hester is a Professor in the newly formed School of Earth and Space Exploration at Arizona State University, where his studies include work on the remnants of supernova explosions, pulsar winds, star formation, the origins of the Solar System, and the interplay between massive stars and their environments. Dr. Hester is a noted public speaker, has been featured in numerous televised documentaries, and is principle author of *21st Century Astronomy*, a layman's guide to



the science of modern astronomy. His work includes some of the best-known astronomical images to be taken with *Hubble*, including his image of the Eagle Nebula (aka, the "Pillars of Creation"), which has become an icon of modern astronomy.

"To Know"

by Jeff Hester, School of Earth & Space Exploration, Arizona State University

We live in a Universe that came into existence 13.7 billion years ago in a cataclysmic "Big Bang," and has been expanding ever since. In that early Universe the simplest chemical elements were born, seed material for further alchemy in the hearts of stars. Some 4.5 billion years ago our own Sun formed from the collapse of a vast cloud of interstellar gas and dust, and on one rock orbiting that run of the mill star, life evolved to contemplate its own existence. We *know* these things to be true. And yet all of this knowledge stands in stark contrast to what humankind has "known" for most of its existence.

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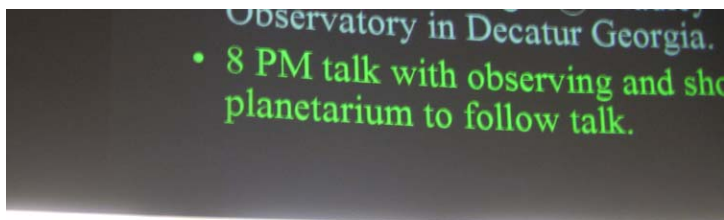
How can science make such claims to knowledge about events and processes that occur so remotely in both time and in distance, and on scales that are all but impossible for the human mind to fathom? It's a fair question, but one that is seldom answered head-on by those who speak for science in public forums. To answer this question we have to ask an even more basic question. What does it mean when we say, "I know" in the first place? Ironically, "really knowing" comes not from trying to prove that something is true, but instead from doing all that you fairly can to show that it is false. And knowing something "for certain" is the same as not knowing it at all.

Like art, literature, and poetry, science is an expression of human creativity as we seek to understand the world around us. Science distinguishes itself by following that creativity with no holds barred intellectual violence, as even the most elegant and beautiful fruits of our creative labors are forced to run a never-ending gauntlet of challenges based on new evidence. That is a standard that can and should be applied any time we care about the real answer to a question, whether it is a question of science or a question in our everyday lives. In the end, only the ideas that can survive that kind of scrutiny and attack are safe places to hang your hat. These are the things that we "truly know."

March 21st General Meeting Minutes

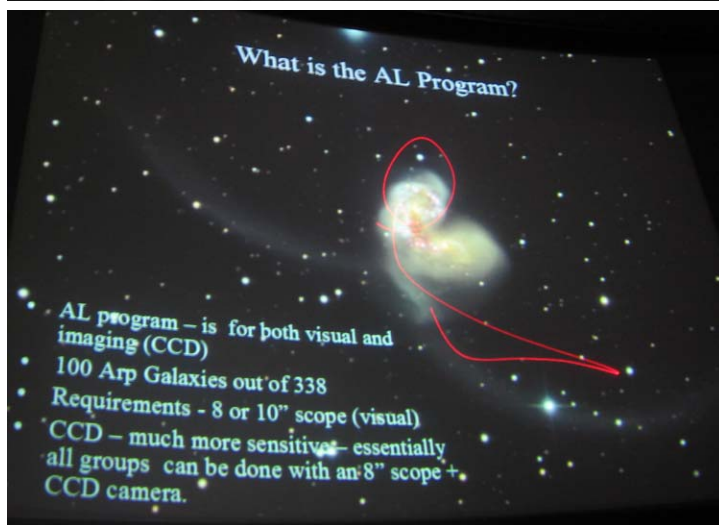
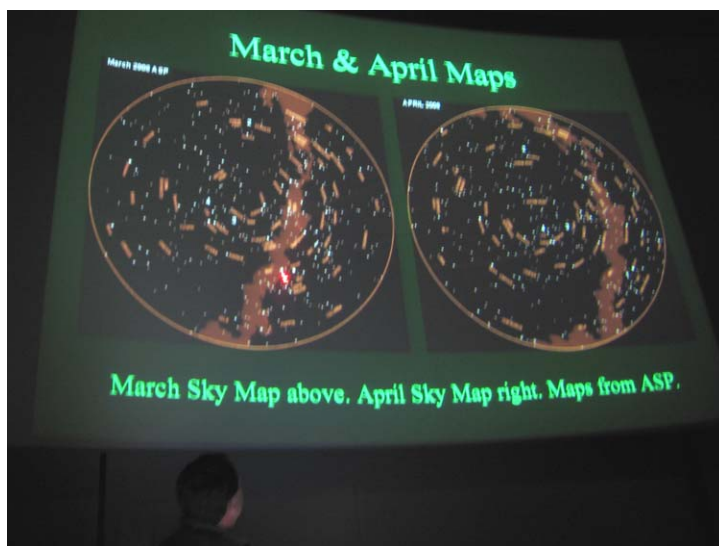
By Richard Jakiel, AAC Recording Secretary

The March 21st general meeting of the AAC started at 8:10 PM, with President Peter Macumber (below) presiding. One of the first topics of discussion was the upcoming change of the Bylaws, proposing a phased reduction of the number of Broad of Directors (BoD) from 6 to 4 over the next two years. More details to follow in the Focal Point. Peter mentioned the formation of the Nominating Committee and the need for AAC members to fill important club officer and BoD positions.



Next month's general meeting (April 18th), will dispense with most of the official business portion due to the large influx of non-AAC visitors and the nature of the presentation. Seating in the main room may be a precious commodity, so the membership is advised to come early (Note: there will be live video feeds in rooms designated for 'overflow').

Earth Hour Activities – Marc Sandberg (right, top) spoke about "Earth Hour", where a number of locations and cities will be observing an hour of 'no lights' between 8 and 9 PM on Saturday, March 29th. He will be coordinating with Georgia Tech for updates and joint observing activities. *Short Programs* – Keith "Kosmic Kow" Burns and Rich "Curly" Jakiel gave short presentations on the 'Night Sky' and the Astronomical League's Arp Galaxy Program. Keith (right, middle) gave a 'double feature', with 10 objects spread across the March and April skies. It included some pretty

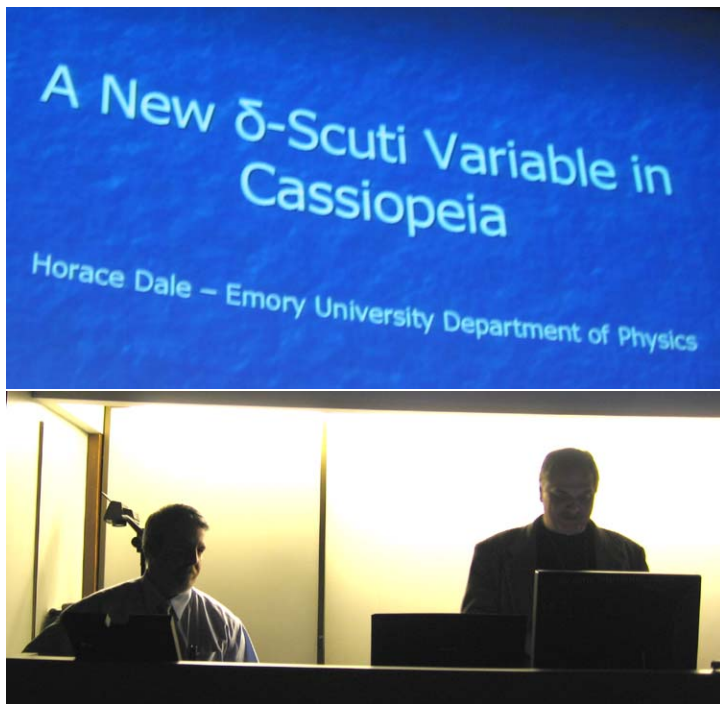


Meeting photos by Tom Faber.

funky graphics and sound bites, plus an assortment of asterisms, star clusters and galaxies (*Editor's Note: See a write-up and charts from Keith's talk in this issue*). Rich discussed the Arp Galaxy program (above), concentrating on backyard imaging these weird and peculiar galaxies.

Continued on next page

Main Program – Emory’s own Horace Dale (below left, being introduced by Alex Langoussis) gave an interesting presentation on the serendipitous discovery of a Delta Scuti type variable in Cassiopeia (right, bottom). During an advanced astronomy lab, one of the photometric comparison stars was found to be a very short period, low amplitude variable star. At 12th magnitude, the discovery of a very short period (0.2 days) and small amplitude variable star near the heart of a large city was a considerable feat of luck and skill.



Charlie Elliott Meeting Minutes

by Clevis Jones, CE Recording Secretary

(Minutes have been edited for space constraints.)

ATTENDANCE: Twenty-two guests and members enjoyed the March 08, 2008 meeting at the Charlie Elliott Visitor's Center.

AWARDS: The brainchild of Jim Honeycutt, the CE ACADEMY OF ARTS AND SCIENCES "secretly" established an award Jim named the LARRY in honor of Larry Owens for his inspiration and encouragement to us all for imaging. For the SURPRISE first ever presentation of the LARRY, it was a TIE: Theo Ramakers and Jonathan Wood each received a LARRY as the directors of the movies they have made from astronomy images. The awarding of the LARRY by our chapter is all for FUN, INSPIRATION, and SINCERE APPRECIATION.

BUSINESS: Director, Larry Owens, reminded everyone that CE Elections are coming up in May and that all three positions are open. Debbie Jones will act as the Election Committee (of one). Please E-mail her if you would care to self-nominate: Debbie @ CEastronomy.org. A review of SPACE CAMP at Hightower Trail Elementary in Conyers, GA was given by Clevis, Theo, and Jon. Information, images and a movie are available in the new "AstroImager Gallery": <http://www.ceastronomy.org/gallery/main.php>

Future Program Scheduled: May 17: JAKES DAY all day (Volunteers????), Elections, Lunar Program by Theo Ramakers. If you would care to volunteer for our part of JAKES DAY, contact Secretary@CEastronomy.org.

2008 schedule for the remaining CE Meetings is: May 17 (JAKES DAY & Election of Officers), Jun. 7, Jul. 26, Aug. 30, Sep. 27, Oct. 25, Nov. 29, Dec. 27.

FEATURE PRESENTATION: "Chichen Itza" by Steve Bieger. This month, Steve took us on a FASCINATING, astronomy oriented tour of Chichen Itza, which stands for "At the mouth of the well of the Itza". It is the Mayan village on the upper Yucatan Peninsula. Most of us can now count in Mayan base 20, except for Larry and Steve who are still stuck in HEX.

CURRENT EVENTS: Clevis Jones covered Auroras, Space shuttle's Atlantis' and STS-122's Columbus mission and Discovery's & STS-123's mission, some images taken by the HIRISE camera currently orbiting Mars, Cassini's discovery that Rhea has rings, and closed with Theo Ramakers movie of the CE members' Total Lunar Eclipse" imaging effort.

And on behalf of everyone who attended ... TO THE HANDS THAT PREPARED THE WONDERFUL FOOD - MANY DELICIOUS THANKS!!! Thank you Alesia & CEWMA.

OBSERVING SESSION: Several brave souls did brave the chill to do some observing.

For Meeting updates, Directions, Links, & Live broadcasts: PLEASE check the CEastronomy website for the most current information! <http://www.CEastronomy.org>

Charlie Elliott Future Meetings

by Clevis Jones, CE Recording Secretary

May 17, JAKES DAY at CE (volunteers needed), Election of CE officers, Lunar Program by Theo Ramakers.

Place: Charlie Elliott Visitor's Center

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>

Bradley Observatory Open Houses

Amateur Astronomy - Unlike nuclear physics or space flight, astronomy is a scientific discipline to which those without advanced degrees in the subject can and do make significant contributions. An amateur is defined as "a person who engages in a study for pleasure rather than for financial benefit or professional reasons." This year, we will hear from and about a number of "amateur" astronomers, and the contributions that they have made, and are making to our understanding of the universe. All lectures will be held at 8PM at Bradley Observatory on the Agnes Scott College campus. Afterwards there will be a planetarium show and observing with the 30-inch Beck Telescope (weather permitting).

April 11, 2008: "NASA's Dawn Mission: Exploring the Asteroid Frontier" - Lucy A. McFadden (University of Maryland).

May 9, 2008: Kevin Marvel (American Astronomical Society).

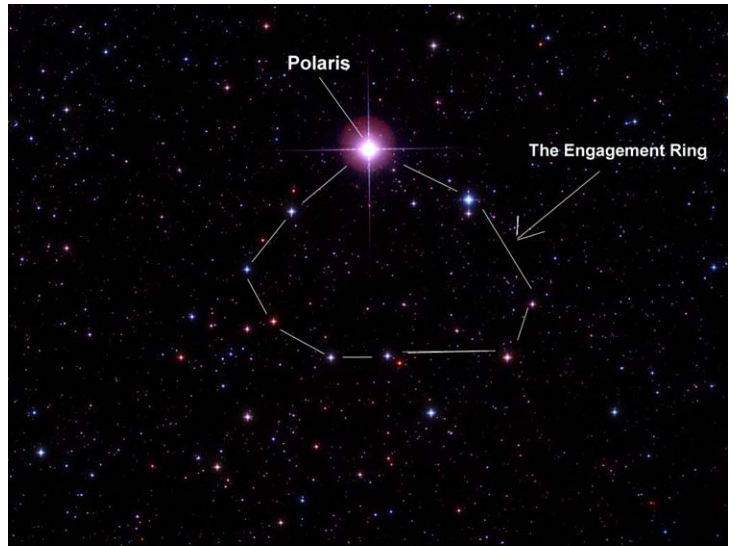
For additional information including directions to Bradley Observatory visit <http://bradley.agnesscott.edu>.

March and April "Nothing To See" List of Objects

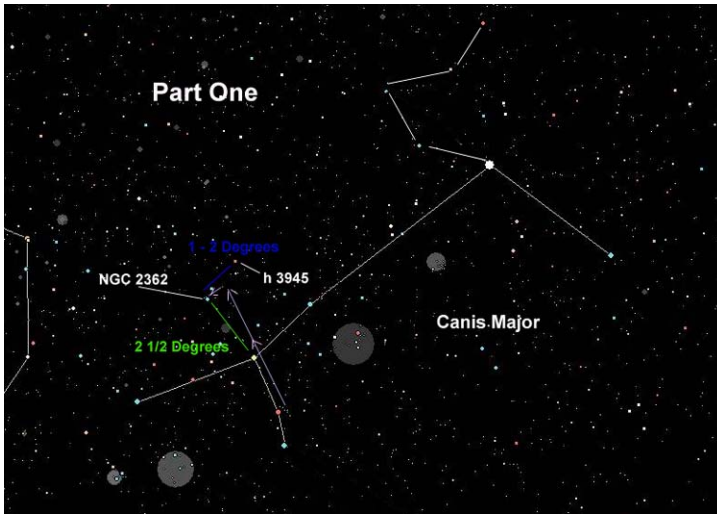
By Keith Burns

- 1) Canis Major- NGC 2362 (Tau Canis Cluster) & h3945 (Winter Alberio)
- 2) Ursa Minor- Polaris, The Engagement Ring, & NGC 188.
- 3) Cancer- M 44 (The Beehive Cluster) & M 67.
- 4) Leo- NGC 2903, The Sickle, & The Sailboat.

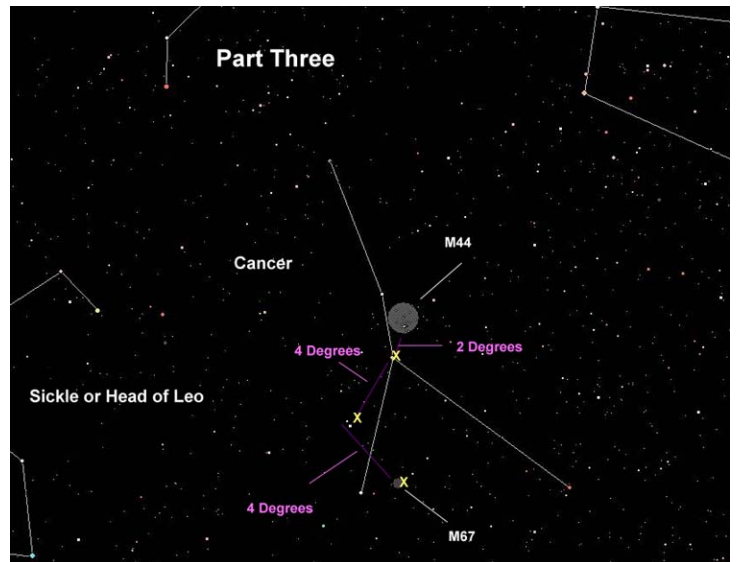
When I started to do this series back in January, I hoped to perhaps include an article about each month's program in the Focal Point. Of course, like any idea, it is much harder to do in practice. As a result, I've put it off for months. Finally after several requests here is the result. There are charts and some pictures included. I have included charts from each of the four parts of the original presentation. Due to space constraints I can't include all the stuff from the Power Point, but these charts are unique in that they are more compressed than the ones contained in the original PPT this month. Plus there are pictures of the Engagement Ring and The Sailboat. So I hope you enjoy. Have fun and perhaps you will learn a few things along the way. Now all you have to do is just imagine the sounds of the PPT. See you again in May.



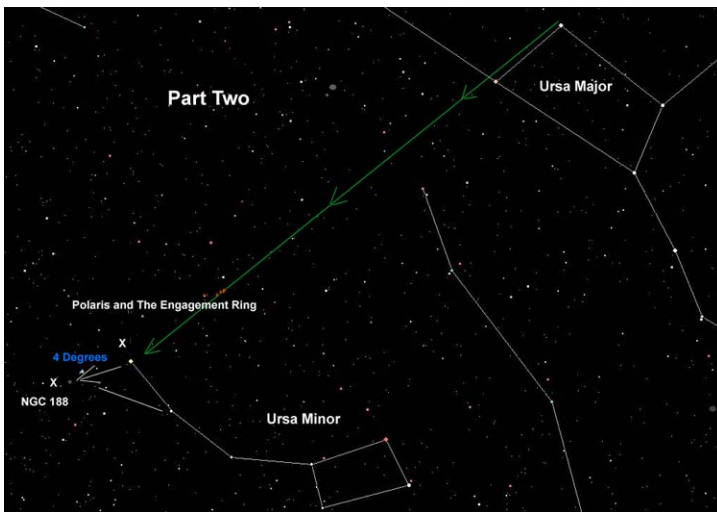
The Engagement Ring



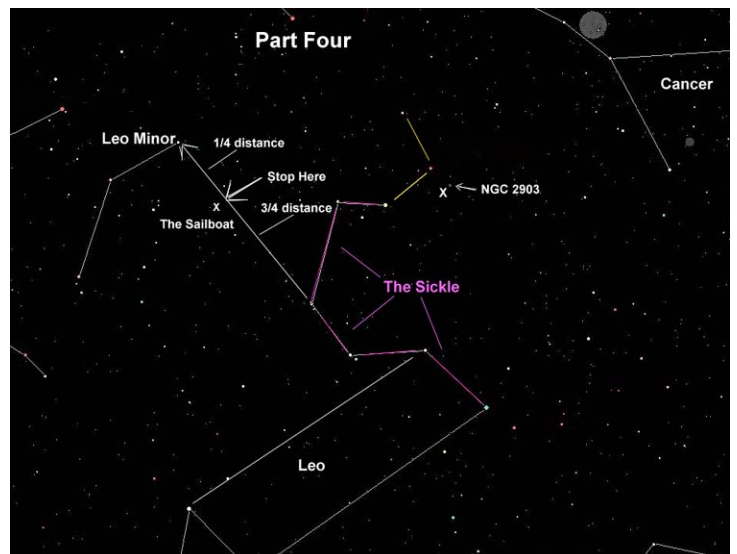
1) Canis Major- NGC 2362 (Tau Canis Cluster) & h3945 (Winter Alberio)



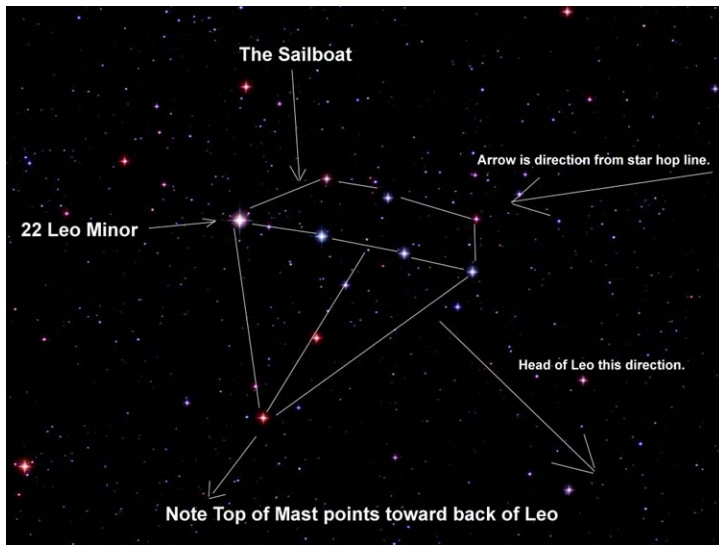
3) Cancer- M 44 (The Beehive Cluster) & M 67.



2) Ursa Minor- Polaris, The Engagement Ring, & NGC 188.



4) Leo- NGC 2903, The Sickle, & The Sailboat. *Continued on next page*



The Sailboat.

Black Hole Found in Center of Enigmatic Omega Centauri

Hubble European Space Agency Information Centre Release

Posted: April 4, 2008

Omega Centauri has been known as an unusual globular cluster for a long time. A new result obtained by the NASA/ESA Hubble Space Telescope and the Gemini Observatory reveals that the explanation behind Omega Centauri's peculiarities may be a black hole hidden in its center. One implication of the discovery is that it is very likely that Omega Centauri is not a globular cluster at all, but a dwarf galaxy stripped of its outer stars, as some scientists have suspected for a few years.

A new discovery has resolved some of the mystery surrounding Omega Centauri, the largest and brightest globular cluster in the sky. Images obtained with the Advanced Camera for Surveys onboard the NASA/ESA Hubble Space Telescope and data obtained by the GMOS spectrograph on the Gemini South telescope in Chile show that Omega Centauri appears to harbour an elusive intermediate-mass black hole in its center.

"This result shows that there is a continuous range of masses for black holes, from supermassive, to intermediate-mass, to small stellar mass types," explained astronomer Eva Noyola of the Max-Planck Institute for Extraterrestrial Physics in Garching, Germany, and leader of the team that made the discovery.

Omega Centauri is visible from Earth with the naked eye and is one of the favourite celestial objects for stargazers from the southern hemisphere. Although the cluster is 17,000 light-years away, located just above the plane of the Milky Way, it appears almost as large as the full Moon when the cluster is seen from a dark rural area. Exactly how Omega Centauri should be classified has always been a contentious topic.

It was first listed in Ptolemy's catalogue nearly two thousand years ago as a single star. Edmond Halley reported it as a nebula in 1677. In the 1830s the English astronomer John Herschel was the first to recognise it as a globular cluster. Now, more than a century later, this new result suggests Omega Centauri is not a globular cluster at all, but a dwarf galaxy stripped of its outer stars.

Globular clusters consist of up to one million old stars tightly bound by gravity and are found in the outskirts of many galaxies including our own. Omega Centauri has several characteristics that distinguish it from other globular clusters: it rotates faster than a run-of-the-mill globular cluster, its



Image credit: NASA, ESA, and the Hubble Heritage Team (STScI/AURA)

shape is highly flattened and it consists of several generations of stars - more typical globulars usually consist of just one generation of old stars.

Moreover, Omega Centauri is about 10 times as massive as other big globular clusters, almost as massive as a small galaxy. These peculiarities have led astronomers to suggest that Omega Centauri may not be a globular cluster at all, but a dwarf galaxy stripped of its outer stars by an earlier encounter with the Milky Way.

"Finding a black hole at the heart of Omega Centauri could have profound implications for our understanding of its past interaction with the Milky Way," said Noyola.

Eva Noyola and her colleagues measured the motions and brightnesses of the stars at the center of Omega Centauri. The measured velocities of the stars in the center are related to the total mass of the cluster and were far higher than expected from the mass deduced from the number and type of stars seen. So, there had to be something extraordinarily massive (and invisible) at the center of the cluster responsible for the fast-swirling dance of stars - almost certainly a black hole with a mass of 40 000 solar masses.

"Before this observation, we had only one example of an intermediate-mass black hole - in the globular cluster G1, in the nearby Andromeda Galaxy," said astronomer Karl Gebhardt of the University of Texas at Austin, USA, and a member of the team that made the discovery.

Although the presence of an intermediate-mass black hole is the most likely reason for the stellar speedway near the cluster's center, astronomers have analysed a couple of other possible causes: a collection of unseen burnt-out stars such as white dwarfs or neutron stars adding extra mass, or a group of stars with elongated orbits that would make the stars closest to the center appear to speed up.

According to Noyola these alternative scenarios are unlikely: "The normal evolution of a star cluster like Omega Centauri should not end up with stars behaving in those ways. Even if we assume that either scenario did

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happen somehow, both configurations are expected to be very short-lived. A clump of burnt-out stars, for example, is expected to move farther away from the cluster center quickly. For stars with elongated orbits, these orbits are expected to become circular very quickly."

According to scientists, these intermediate-mass black holes could turn out to be "baby" supermassive black holes. "We may be on the verge of uncovering one possible mechanism for the formation of supermassive black holes. Intermediate-mass black holes like this could be the seeds of full-sized supermassive black holes." Astronomers have debated the existence of intermediate-mass black holes because they have not found strong evidence for them and there is no widely accepted mechanism for how they could form. They have ample evidence that small black holes of a few solar masses are produced when giant stars die. There is similar evidence that supermassive black holes weighing the equivalent of millions to billions of solar masses sit at the heart of many galaxies, including our own Milky Way.

Intermediate-mass black holes may be rare and exist only in former dwarf galaxies that have been stripped of their outer stars, but they could also be more common than expected, existing at the centers of globular clusters as well. A previous Hubble survey of supermassive black holes and their host galaxies showed a correlation between the mass of a black hole and that of its host. Astronomers estimate that the mass of the dwarf galaxy that may have been the precursor of Omega Centauri was roughly 10 million solar masses. If lower mass galaxies obey the same rule as more massive galaxies that host supermassive black holes, then the mass of Omega Centauri does match that of its black hole.

The team will use the European Southern Observatory's Very Large Telescope in Paranal, Chile to conduct follow-up observations of the velocity of the stars near the cluster's center to confirm the discovery.

NASA Scientists Identify Smallest Known Black Hole

NASA-Goddard News Release - April 1, 2008

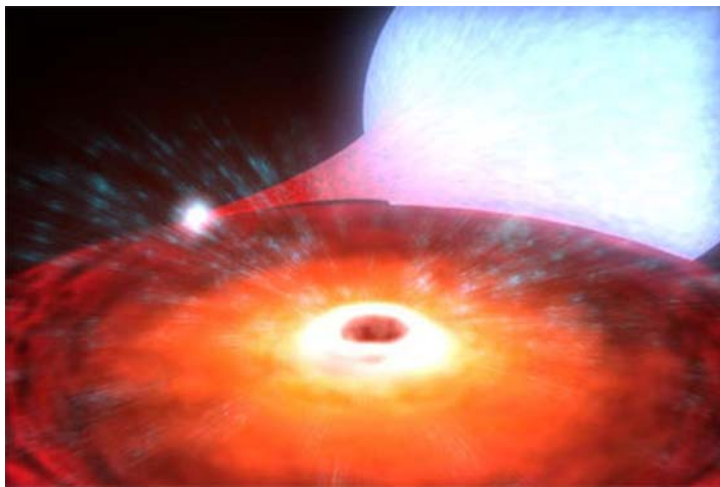
GREENBELT, Md. - Using a new technique, two NASA scientists have identified the lightest known black hole. With a mass only about 3.8 times greater than our Sun and a diameter of only about 15 miles, the black hole lies very close to the minimum size predicted for black holes that originate from dying stars.

"This black hole is really pushing the limits. For many years astronomers have wanted to know the smallest possible size of a black hole, and this little guy is a big step toward answering that question," says lead author Nikolai Shaposhnikov of NASA's Goddard Space Flight Center in Greenbelt, Md.

Shaposhnikov and his Goddard colleague Lev Titarchuk are presenting their results at the American Astronomical Society High-Energy Astrophysics Division meeting in Los Angeles, Calif. Titarchuk also works at George Mason University in Fairfax, Va., and the US Naval Research Laboratory in Washington, DC.

The tiny black hole resides in a Milky Way Galaxy binary system known as XTE J1650-500, named for its sky coordinates in the southern constellation Ara. NASA's Rossi X-ray Timing Explorer (RXTE) satellite discovered the system in 2001. Astronomers realized soon after J1650's discovery that it harbors a normal star and a relatively lightweight black hole. But the black hole's mass had never been measured to high precision.

The method used by Shaposhnikov and Titarchuk has been described in several papers in the *Astrophysical Journal*. It uses a relationship between black holes and the inner part of their surrounding disks, where gas spirals inward before making the fatal plunge. When the feeding frenzy reaches a moderate rate, hot gas piles up near the black hole and radiates a torrent of



The lowest-mass known black hole belongs to a binary system named XTE J1650-500. The black hole has about 3.8 times the mass of our sun, and is orbited by a companion star, as depicted in this illustration. Credit: NASA/CXC/A. Hobar

X-rays. The X-ray intensity varies in a pattern that repeats itself over a nearly regular interval. This signal is called a quasi-periodic oscillation, or QPO.

Astronomers have long suspected that a QPO's frequency depends on the black hole's mass. In 1998, Titarchuk realized that the congestion zone lies close in for small black holes, so the QPO clock ticks quickly. As black holes increase in mass, the congestion zone is pushed farther out, so the QPO clock ticks slower and slower. To measure the black hole masses, Shaposhnikov and Titarchuk use archival data from RXTE, which has made exquisitely precise measurements of QPO frequencies in at least 15 black holes.

Last year, Shaposhnikov and Titarchuk applied their QPO method to three black holes whose masses had been measured by other techniques. In their new paper, they extend their result to seven other black holes, three of which have well-determined masses. "In every case, our measurement agrees with the other methods," says Titarchuk. "We know our technique works because it has passed every test with flying colors."

When Shaposhnikov and Titarchuk applied their method to XTE J1650-500, they calculated a mass of 3.8 Suns, with a margin of uncertainty of only half a Sun. This value is well below the previous black hole record holder with a reliable mass measurement, GRO 1655-40, which tips the scales at about 6.3 Suns.

Below some unknown critical threshold, a dying star should produce a neutron star instead of a black hole. Astronomers think the boundary between black holes and neutron stars lies somewhere between 1.7 and 2.7 solar masses. Knowing this dividing line is important for fundamental physics, because it will tell scientists about the behavior of matter when it is scrunched into conditions of extraordinarily high density.

Despite the diminutive size of this new record holder, future space travelers had better beware. Smaller black holes like the one in J1650 exert stronger tidal forces than the much larger black holes found in the centers of galaxies, which make the little guys more dangerous to approach. "If you ventured too close to J1650's black hole, its gravity would tidally stretch your body into a strand of spaghetti," says Shaposhnikov.

Shaposhnikov adds that RXTE is the only instrument that can make the high-precision timing observations necessary for this line of research. "RXTE is absolutely crucial for these black hole mass measurements," he says.

Important Notice - The AAC Board decided last year that effective immediately the dues for new and renewing members who receive the MAILED version of the *Focal Point* will increase by \$5.00 per year. This is due to increased printing and mailing costs for the printed *Focal Point*. The dues will remain the same for members who receive the on-line newsletter. If you wish to switch from the mailed *Focal Point* to downloading the PDF version (and save \$5) notify Sharon Carruthers at Treasurer@AtlantaAstronomy.org. Also please notify Sharon with any changes to your contact information.

Georgia Astronomy in State Parks (GASP) Events

The GASP events for 2008 are being planned. Scheduled so far is:

November - Red Top Mountain State Park - Date TBA.

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 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

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Co-Chair: Joanne Cirincione starrynights@AtlantaAstronomy.org

Sidewalk Astronomy: Brad Isley
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Woodruff Observ. Coordinator: Sharon Carruthers
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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.

Calendar by Tom Faber (All times EDT unless noted)

- April 5th, Saturday: **CEC Meeting** - See pg 3 for details. New Moon.
- April 11th, Friday: Bradley Observatory Open House, 8PM. See pg. 3 for details.
- April 12th, Saturday: **Open House at Villa Rica** - Contact Daniel Herron for details. Moon First Quarter.
- April 18th, Friday: **AAC Meeting/Jeff Hester talk at White Hall, 8PM, Emory University.**
- April 19th, Saturday: **Telescope & Instrument Workshop** - Contact Sharon Carruthers for details. Full Moon.
- April 23rd, Wednesday: Lyrid Meteors.
- April 28th, Monday: Moon Last Quarter.
- May 1st, Thursday: Mercury near M45.
- May 3rd, Saturday: **DSO at location TBA** - Contact Daniel Herron for details.
- May 5th, Monday: New Moon. Eta Aquarids Meteors.
- May 6th, Tuesday: Moon near Mercury.
- May 9th, Friday: Bradley Observatory Open House, 8PM. See pg. 3 for details.
- May 10th, Saturday: Moon near M44.
- May 11th, Sunday: Moon First Quarter.
- May 12th, Monday: Moon near Saturn & Regulus.
- May 13th, Tuesday: Mercury Greatest Eastern Elongation.
- May 16th, Friday: **AAC Meeting at White Hall, 8PM, Emory University.**
- May 17th, Saturday: **Telescope & Instrument Workshop** - Contact Sharon Carruthers for details. **CEC Meeting** - See pg 3 for details.
- May 19th, Monday: Full Moon.
- May 20th, Tuesday: Moon near Antares.
- May 22nd, Thursday: Mars in M44.
- May 24th, Saturday: Moon near Jupiter.
- May 27th, Tuesday: Moon Last Quarter.
- May 31st, Saturday: **DSO at location TBA** - Contact Daniel Herron for details.

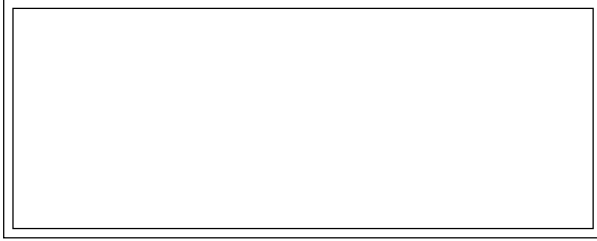
Atlanta Astronomy Club Listserve

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 Submission Information

Please send articles, pictures, and drawings in electronic format on anything astronomy related to Kat Sarbell 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 and including the deadline date. **The deadline for May is Thursday, April 24th at 4:00 PM ... Submissions will no longer be accepted after the deadline.**

FIRST CLASS



Newsletter of The Atlanta Astronomy Club, Inc.

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

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