

The Focal Point

The Atlanta Astronomy Club
Established 1947
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Editor: Tom Faber

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March General Meeting

Please join us for the next meeting of the Atlanta Astronomy Club, to be held on Saturday, March 14th at **3PM at the Fernbank Science Center**. Since Fernbank closes at 5PM on Saturdays we will now begin our meetings at 3PM. A short beginner's program will be presented at 2PM. The General Meeting will start at 3PM. Our featured speaker will be Anita Westlake who will present a talk about meteorites.

After the talk, upcoming club events and programs will be announced by the club officers.

Speaker Biography

Anita D. Westlake has been studying and collecting meteorites for over 10 years. Her fascination began when Jerry Armstrong showed her an Allende meteorite and told her it was older than our solar system. She bought that specimen and has been collecting ever since.

On a recent trip to Tucson for their annual gem and mineral show, Anita was the invited guest speaker at the Michael Blood Meteorite Auction. She has written for Meteorite magazine and has enjoyed rubbing elbows with Geoffrey Notkin and Steve Arnold of the "Meteorite Men" TV series at their annual "Birthday Bash".

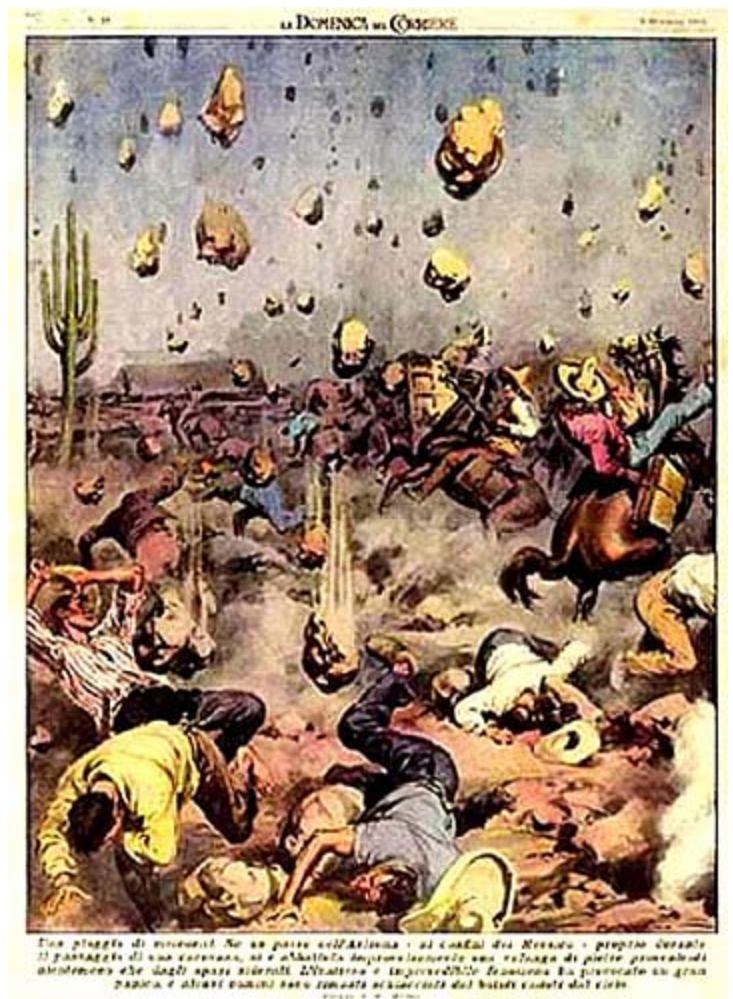
Anita worked for the Tellus Science Museum in Cartersville, Ga. and helped the public with mineral and meteorite identification.



March is Membership Renewal Month

The AAC has moved to a "one-date-for-all" membership renewal. ALL CLUB MEMBERS, with certain exceptions, should submit their \$30 dues for 2015 by the end of March. Please send your renewals to AAC Treasurer Sharon Carruthers, renew online using PayPal, or you can bring your renewal to the March Meeting. For more information see: http://atlantaastronomy.org/?page_id=22

Thank You for your support of the AAC!



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The Talk

Meteorites fall to Earth every day but most are never recovered. Sometimes they land in interesting places or hit something man-made, causing damage and creating stories. Anita Westlake, co-founder and first President of the Meteorite Association of Georgia (MAG) will cover types of meteorites, how to tell the real ones from the “meteorwrongs”. You will learn of people, places and things that were hit as well as their values and best collecting practices. Specimens will be available to pass around and purchase. Bring your sense of humor; all science isn't dry and dusty.

Future Meetings will be on the 2nd Saturday

The AAC meetings are now on the second Saturday of each month, still at the Fernbank Science Center and at 3PM. The next few meeting dates are: Apr 11, May 9, & June 20.

February AAC Meeting Report

By Alan Coffelt, AAC Recording Secretary. Photos by Tom Faber

This month's general meeting was on Saturday, February 14th, starting at 3pm at the Fernbank Science Center. There were 45 members and guests present for the meeting.

Before the talk, Richard Jakiel announced next month's speaker and upcoming dark sky observing events. He also reminded us that Comet Lovejoy is still a good view this month, along with Jupiter and Venus. Mark banks announced that several upcoming public events are listed on the club calendar and invited everyone to attend. He also reported that the roll off roof structure at the Villa Rica site has been replaced successfully. Also, a reminder that March is AAC membership renewal month. Tom Faber announced the deadline for submitting for the March *Focal Point* is February 21st. Jamie Anderson said there were no ALCor awards to be presented this month, but mentioned that the club now has a small radio telescope that he is working on and that there are Astronomical League awards for radio astronomy if anyone is interested. Finally, member Ken Poshedly invited club members to consider membership in the Association of Lunar and Planetary Observers (ALPO) which offers an excellent quarterly journal and other resources to help its members with lunar and planetary astronomy.

Our guest speaker was astronomer, author, and educator, Dr. Larry Krumenaker. His entertaining and informative talk was on material from a forthcoming book called *Federation Space, the Real Stars of Star Trek*.

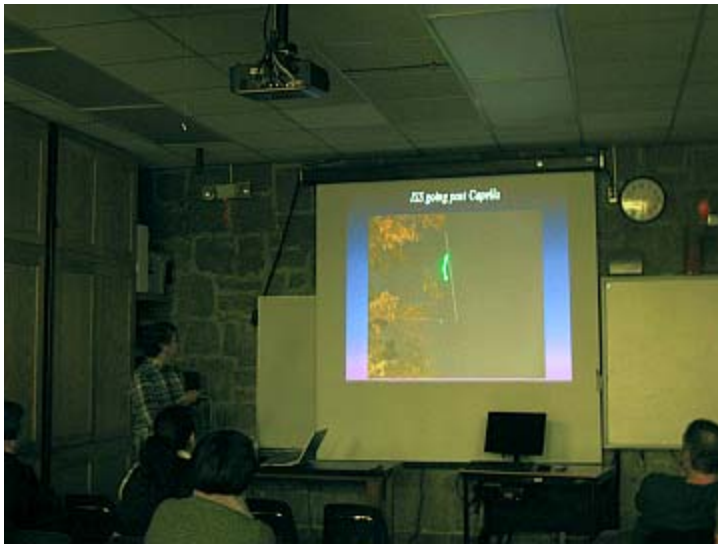
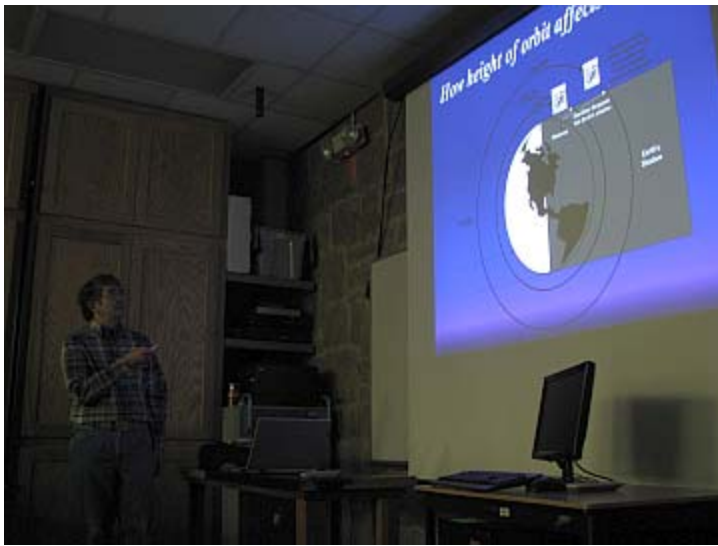
Dr. Krumenaker points out that throughout the various Star Trek incarnations and movies (original series, next generation, etc.) there have been references to both real as well as fictitious star systems. Looking at

just the real ones, what can this teach us astronomically? Using a fun exercise with a star field and volunteers from the audience, Dr. Krumenaker reviewed how we describe stars (brightness, color, and location). What are the objects we can use from Star Trek? Limiting objects to those within our galaxy where action in the story takes place, or where a character mentions an object or location in the dialog, there are just 43 references that match real astronomical objects. The rest are made up. (Too bad it wasn't 42!)

Using the 43 objects, Dr. Krumenaker has plotted out where some of the members of the federation (as well as some of the bad guys) are located in space. Talking about the federation members allowed us to talk about interesting astronomy and concepts along the way. For example, how parallax is one method that helps us determine the distance to stars, how the celestial coordinates and constellations help us locate objects, how distances are measured, and how the Milky Way galaxy is structured. Dr. Krumenaker also talked about star brightness and color, and what that might mean for life in those systems. It turns out that while some of the 43 stars are very unlikely to have planets or life, a few of the stars actually do have exoplanets or dust rings. Dr. Krumenaker concluded his talk by pointing out specific stars and their associated Star Trek episodes.



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Before the general meeting Tom Faber presented the beginner's talk about observing satellites. Photos by Kat Sarbell

The Next Charlie Elliott Meeting

Potluck! Join us for our next meeting at 4:30 p.m., Saturday, March 21st, 2015 at the Campbell Aquatic Building. Questions? Contact one of our officers or check <http://ceastronomy.org/blog/home>.

Meeting Agenda

Join us on March 21, 2015 at 4:30 p.m. for our quarterly potluck! If you've been to one of our potlucks, you're probably looking forward to the good food and good company these events have become known for. Astronomical League liaison Jack Fitzmier will be doing another book review. Dr. Fitzmier is a dynamic and engaging speaker and always manages to find great reads! Potlucks take a lot of effort to organize, and ours are no different. In addition to banana pudding and potato salad, we need help with set up and clean up. If you can bring food or offer a few minutes to help with setup or clean up, click here (<http://www.perfectpotluck.com/meals.php?t=CDKY8227>) to find out how you can help.

What's Up! - Charlie Elliott Astronomy Observing Supervisor John Towne will be giving a short presentation of what you can expect to see in the sky this month with binoculars and small telescopes as well as the monthly Charlie Elliott Observing Challenge. At the meeting, remember to

ask John for the target list and SkyMap! The target list and presentation from the last meeting are available for download at the CE Chapter web page.

Sunset Time Alert - While we would love for everyone to stay for the entire meeting, we realize that some folks prefer to leave a bit earlier so as to set up their equipment at the observing field before dark. If the meeting runs longer than planned, a "Sunset Time Alert" will be announced.

"Observing after the Meeting" - All are invited to Jon Wood Astronomy Field immediately after the meeting (weather-permitting). You don't have to be a member to attend the meeting or join us on Jon Wood Astronomy Field with your telescope (or just your eyeballs). Note: The security gate at the entrance to the main road leading up to the observing field closes at 10:00 p.m. You'll be able to leave at any time, but you won't be able to get in after 10:00 p.m. You will, however, be able to park near the gate and walk a few hundred feet to the observing field after 10:00 p.m.

Place: Jon Wood Astronomy Field at Charlie Elliott Wildlife Center.

February CE Astronomy Meeting Report

By Steve Siedentop, CE Astronomy Director

Steve Siedentop started the meeting promptly at 4 p.m. Observing Supervisor John Towne gave the monthly What's Up presentation, covered a handful of interesting occultations, and presented an intriguing challenge object, NGC 2438 a planetary nebula in Messier 46! Jack Fitzmier extolled the virtues of the Astronomical League's observing plans and presented awards. Valerie Whalen gave an update on the outreach efforts of the chapter and presented Night Sky Network outreach awards. In 2014, the chapter held 76 outreach events, with 22 members participating, with a total of 974 volunteer hours and 11,509 miles driven. Sam Quinn gave a great talk on his research as a PhD candidate at Georgia State University on finding exoplanets in open clusters, which is a relatively new area of research, although the existence of these exoplanets was predicted as far back as 1952. Steve Siedentop announced that the next meeting would be March 21, 2015 at 4:30 p.m. This meeting is our quarterly potluck and will be held in the Campbell Building. Twenty-six members and guests were in attendance at the February Meeting.

The AAC Zombie Party

By Daniel Herron, AAC Observing Chair

This year's Zombie Party is scheduled for Thursday, April 16 thru Sunday, April 19 (3 nights) at the Deerlick Astronomy Village.

The Zombie party is a no-frills, open to the public, 3 night star party hosted by the Atlanta Astronomy club. No speakers, workshops or sessions just observing. This event is open to all, beginners and, experts alike, AAC members, and non-members (how else are we going to get you hooked!).

Cost is 10 dollars per night per person.

No pre-registration necessary, pay once you arrive. This cost covers the fee to use the field (\$5 per person per night) and the rest goes to support the AAC.



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Weather report:

General rule if the weather looks to be rainy during the night we will just cancel for that night and start the party the next day. I will make the go/no-go decision for Thursday by Wednesday night.

Note:

The Zombie party got its name from the way we all look the next morning after staying awake all night observing and has nothing to do with the undead that are occasionally rumored to walk the area! 😊

New AL Radio Astronomy Observing Program and a Small Radio Telescope Available

By Jamie Anderson, AAC AL Coordinator

Recently several new Astronomical League observing programs have appeared, one being the Radio Astronomy Observing Program. Additionally, the AAC received a donation of a small radio telescope setup that is a great start for club members interested in pursuing the program. Our setup is a SuperSID Monitor (sudden ionosphere disturbance) which is used to detect changes to the upper atmosphere caused by the influence of x-ray and uv radiation from our sun during solar events such as solar flares, solar storms, and coronal mass ejections.

The AL Radio Astronomy program has 3 levels starting with Bronze, and our SuperSID is a great instrument for collecting data to earn this initial level. Overall, the SuperSID consists of a square wire loop antenna, a small signal preamp, a sound card, several cables, and a laptop loaded with the appropriate software. The square loop antenna is not very heavy, but does require some space in a vehicle to transport as it is around five feet high and five feet across. I was able to just barely fit the square shape of the antenna inside a Honda minivan with the middle seats all the way forward and the rear seats removed.

The SuperSID setup works by monitoring VLF radio waves (from 3 - 30kHz) transmitted from several stations that are used to communicate with submarines. Solar events cause characteristics of the Ionosphere to change which is reflected as variations in the level of the signals being monitored. The data is shown as a graph on the laptop. There is also a data collection effort by Samford, so any data captured during use of the monitor can be uploaded to their database for use by others.

I have set up the monitor to make sure everything is functioning and was very excited to see several signals being received by the tuner displayed on the laptop screen, even with the antenna set up in the basement. I am going to try to collect some data over the next few days and ultimately



would like to take the setup out to our clubhouse at DAV to allow it to be used by interested club members. I believe it would be possible to set the system up for remote access as well and that way people could set up/make observations remotely.

Finally, I would like to congratulate a new member of our club, Scott Lookabill. I first met him at the February Meeting at Fernbank Science Center and he has received the Bronze Level AL award, Certificate #1 using his own SID setup!

AAC Notes

Upcoming DSO Dates and Locations

These are the dates for the next few AAC Dark Sky Observing (DSO) events. All of these events are scheduled to be at Grier's Field at the Deerlick Astronomy Village: March 21, Zombie Party April 16-19 at DAV. The locations and dates of the DSOs may change - check the AAC web page for any updates.

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>

The Focal Point Archives

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

Bradley Observatory Open Houses

Open House Lecture Series for the 2014-2015 school year. The lectures are generally on the second Friday of each month (no open house in January) and run from 8:00PM to 9:00PM. They are followed by viewing with the Observatory's 30-inch Beck Telescope and smaller telescopes (weather permitting). For updates or possible changes to the schedule of lectures see: <http://www.agnesscott.edu/bradleyobservatory/open-house-series.html> **March 27:** Spring Equinox Concert, **April 24:** Quantum Computing - Adam Meier (GTRI), **May 15:** Cassini Mission - Carol Paty (Ga Tech).



Countdown to Pluto

Encounter - 4 Months

The PI's Perspective: Pluto Science, on the Surface

By Alan Stern, New Horizons Principle Investigator, February 26, 2015

New Horizons remains healthy and on course for its prime Pluto system science in July!

As I write these words I am flying to a dress-rehearsal simulation (called a "sim") of the closest approach portion of the Pluto flyby. About 40 science team members are involved—atmospheric scientists, geologists, geochemists, planetary astronomers and space physics experts. This is the second of three such multiday sims that the science team is doing to prepare for the flyby in July.

But this is far from the only type of flyby simulation we're doing across the project. There are also sims to practice optical navigation to home in on Pluto, sims to practice searching for hazards on approach, sims to handle possible instrument and spacecraft anomalies, and more. Some sims only involve a handful of people, some (like the one I'm headed to) are much larger; but all involve practice datasets that scientists and engineers retrieve, reduce and analyze as a part of the practice. In total, several dozen mission sims have already been completed over the past few years. Now that we're on early approach, we have just a few left. Hard to believe, but we're almost finished training for encounter operations!

Right now, just as when I wrote in January, the SWAP, PEPSSI and SDC instruments are taking daily science data measuring the charged particle and dust environment of space near Pluto's orbit. And now, the LORRI long-focal-length camera aboard New Horizons has started imaging the Pluto system for navigation purposes. This has yielded a few dozen images of Pluto and Charon which still remain just dots in the distance against star fields. Despite the low-resolution imagery of Pluto and Charon when we are still so far out (well over 100 million miles), these images help us triangulate the distance to our targets more accurately than any other navigation technique we have.

Of course, the images are getting better as we get closer, and by April, they will begin to reveal Pluto as a tiny globe a few pixels across, rotating in the

far distance, by then just 70 million miles or so away.

Last month, I wrote about the Pluto atmospheric science we plan to do during the flyby, and promised that this month I'd preview the surface geology, geophysics and composition measurements we're planning.

But before I tell you what we'll be doing to explore these aspects of the Pluto system, I want to tell you the basics of what we know about Pluto's surface geology and composition, and what we know about Charon's too. Unfortunately, it isn't much.

We know that Pluto's surface is, on average, extremely reflective, like freshly driven snow. We also know that surface has very large markings with greatly varying reflectivities and various shades of red to neutral color. We know the surface ices are dominated by molecular nitrogen, and that hydrocarbons like methane and ethane are present, as is carbon monoxide ice. We also know that the proportions of all of these ices vary as Pluto rotates and shows us different terrains. We don't know much else, because we can't see enough detail from Earth to determine the planet's geology, how cratered it is, or any signs of ongoing geophysical or geologic activity. That has to wait for New Horizons in July.

We know even less about Charon. Its surface is about half as reflective as Pluto's, but still reflective enough to be indicative of ices, as opposed to dark soils like on the Moon and Mars. We know that Charon's surface is not tinged red like Pluto, but is neutrally colored. And we know that Charon is covered primarily in water ice, with hints of ammonium hydrates laced into the surface. Like Pluto, our current lack of spatial resolution prevents us from knowing much more.

Frustrating as our lack of knowledge about Pluto and Charon is, it's all about to change, beginning in just a few months when New Horizons becomes close enough to start seeing new details.

Our objectives for studying the geology, geophysics and geochemistry (surface composition studies) of Pluto and its family of five known moons were set by scientific advisory committees to NASA; they include:

- * Mapping the surfaces of Pluto and Charon, including in color.
- * Mapping the distribution of major ices and minerals on their surfaces, and searching for minor constituents too.
- * Mapping the temperatures of the major ices across their surfaces.
- * Stereo mapping to determine the 3-D topography across large swaths of both bodies.
- * Determining the shapes of Pluto and Charon to exquisite accuracy as a clue to whether one or both have internal oceans, or solid cores or both.
- * Better determining the radii, masses and densities of both bodies.
- * Determining the number of craters across different portions of both bodies as a guide to the relative ages of the different surface units.

By the way, we'll attempt to achieve many of these objectives on Pluto's smaller moons too, though some are not well positioned at flyby (given their tiny sizes) for as detailed a look as we'll have at Pluto and Charon.

Just like our atmospheric science objectives, the list of geology, geophysics and geochemistry objectives is long and ambitious. But we're carrying a very capable suite of scientific instruments designed to probe these questions. Here's a brief preview of the New Horizons instruments that address them:

Ralph is our primary mapper; it will obtain black and white, color, and composition maps of Pluto and its moons. These will be used to address virtually all of the objectives listed above. In fact, some of the spectral bands Ralph will map across these bodies will even let us indirectly map surface temperature variations from place to place and overlay those on color, composition and geologic maps.

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NASA's New Horizons is the first mission to Pluto, a voyage to understand the worlds at the distant edge of the planetary frontier. New Horizons will fly past Pluto and its moons in July 2015, before venturing deeper into the distant, mysterious Kuiper Belt – a relic of solar system formation.

LORRI is our high-resolution imager; although it doesn't have many of Ralph's sophisticated color and composition mapping capabilities, it has about five times the magnification and therefore about five times the resolution on the surface that Ralph offers. We'll use it to map Pluto and its moons, to determine the granular properties of their surfaces (by observing how their brightness varies from place to place at many different angles), and to give us high-resolution shape profiles. LORRI's best images will have resolutions just a little better than 100 meters per pixel on both Pluto and Charon something unprecedented in a first planetary flyby. And LORRI imaging of each object taken at different points along the flyby trajectory when we are close will let us make stereo maps to reconstruct 3-D topography.

(Image: NASA/JHUAPL/SwRI/Dan Durda/Magda Saina)

Object	Panchromatic	Color	Composition Mapping
Pluto	0.5 hemispheric 0.1 regional	0.6 hemispheric	6.0 hemispheric
Charon	0.6 hemispheric 0.15 regional	1.4 hemispheric	8.4 hemispheric 4.7 local
Nix	0.5 hemispheric	2.0 hemispheric	3.6 hemispheric
Hydra	1.1 hemispheric	4.6 hemispheric	14.6 hemispheric
Styx	3.2 hemispheric	8 hemispheric	200 hemispheric
Kerberos	3.2 hemispheric	44 hemispheric	24 hemispheric

This table summarizes the approximate best resolution (in km/pixel) New Horizons will obtain on each body in the Pluto system for various types of imaging. Panchromatic Imaging means black and white.

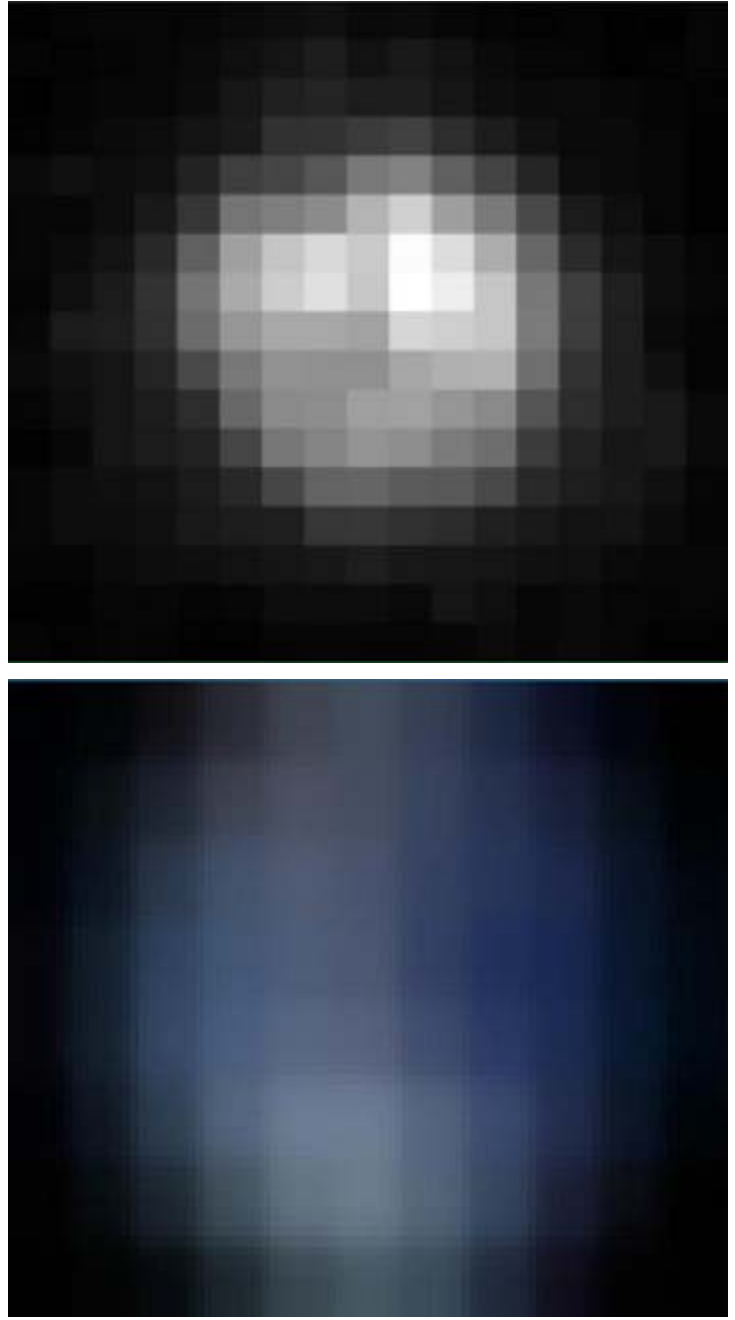
REX, our radio science experiment, will better determine the diameters of Pluto and Charon through radio-occultation experiments. It'll also yield better masses for the two bodies by tracking (with radio, of course) how our trajectory changes as we fly by. And it will directly measure surface temperatures in a special mode called radiometry.

As you can see, we have in our arsenal a wide variety of ways to reveal the surface geologies, compositions, and internal geophysics of both Pluto and Charon and Pluto's smaller moons.

The fun begins in late May, intensifying across June and then July. So stay tuned: As I said last month, soon I won't have to write about plans because I'll be able to tell you about results.

Well, that's it for now, I'll write again in about a month. Until then, I hope you'll keep exploring just as we do.

Images Right: Even the best images of Pluto, made by the Hubble Space Telescope, are too crude to reveal geologic details, because they can only put few pixels across the planet. Compare a Hubble image of Pluto (left) to an artificially blurred image of Earth at the same pixilation, and you'll see how little we know!



Circumstellar Disk Distorted by a Planet

NASA/STScI February 19, 2015

Over a decade before planets were found orbiting normal stars, the astronomy world was intrigued by the discovery of a vast, edge-on, pancake-flat disk of dust and gas encircling the newborn star Beta Pictoris. It appeared to validate the hypothesis by the German philosopher Immanuel Kant, 230 years ago, that our solar system was born when planets condensed from nebular material in the plane of such a disk. (This model was independently proposed by French scholar Pierre-Simon Laplace in 1796.) Kant regarded the coplanar orbits of the planets a fossil skeleton of the long-ago disintegrated disk. Though nearly two dozen circumstellar debris disks have been viewed by Hubble to date, Beta Pictoris is the first and best example of what a forming young planetary system looks like. That's because it can be seen edge on, and it is the only disk to date where a planet has also been imaged. Hubble has been used to intensively study the disk for the past two decades and this latest picture when compared to previous observations shows that the disk particles appear to smoothly revolve around the star like a majestic carousel. Ground-based telescopes found a Jupiter-sized world embedded in the disk in 2009, and future observations may yield more planetary objects.



The photo at the bottom is the most detailed picture to date of a large, edge-on, gas-and-dust disk encircling the 20-million-year-old star Beta Pictoris. The new visible-light Hubble image traces the disk in closer to the star to within about 650 million miles of the star (which is inside the radius of Saturn's orbit about the Sun). When comparing the latest images to Hubble images taken in 1997 (top), astronomers find that the disk's dust distribution has barely changed over 15 years despite the fact that the entire structure is orbiting the star like a carousel. The Hubble Space Telescope photo has been artificially colored to bring out detail in the disk's structure. Credit: NASA, ESA, and D. Apai and G. Schneider (University of Arizona).

The **Atlanta Astronomy Club, Inc.**, one of the South's largest and oldest astronomical society, meets at **3:00 P.M.** on the 2nd Saturday of each month at the Fernbank Science Center in Decatur, or occasionally at other locations or times. 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. AAC Web Page: <http://www.AtlantaAstronomy.org>. Send suggestions, comments, or ideas about the website to webmaster@AtlantaAstronomy.org. Also send information on upcoming observing events, meetings, and other events to the webmaster.

Atlanta Astronomy Club Online

While this newsletter is the official information source for the Atlanta Astronomy Club, it is only up to date the day it is printed. So if you want more up to date information, go to our club's website. The website contains pictures, directions, membership applications, events updates and other information. <http://www.atlantaastronomy.org> You can also follow the AAC on Facebook by joining the AAC group, and on Twitter at <http://twitter.com/atlastro>.

AAC Officers and Contacts

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PSSG Co-Chair: Open

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

AAC Events are listed in **BOLD**

- Mar 2nd, Monday: Moon near Jupiter.
- Mar 5th, Thursday: Full Moon.
- Mar 8th, Sunday: Daylight-Saving Time starts at 2:00AM.
- Mar 12th, Thursday: Moon near Saturn.
- Mar 13th, Friday: Moon Last Quarter.
- Mar 14th, Saturday: **AAC Meeting at Fernbank Science Center 3:00PM.**
- Mar 20th, Friday: New Moon. Spring Equinox at 6:45PM EDT.
- Mar 21st, Saturday: Moon near Mars. **DSO at DAV, CEA Meeting at 4:30PM.**
- Mar 22nd, Sunday: Moon near Venus.
- Mar 27th, Friday: Moon First Quarter.
- Apr 4th, Saturday: Full Moon. Partial Lunar Eclipse (Partial phase begins 6:15AM).
- Apr 6th, Monday: Uranus Conjunction with Sun.
- Apr 10th, Friday: Mercury at Superior Conjunction.
- Apr 11th, Saturday: Moon Last Quarter. Venus near Pleiades. **AAC Meeting at Fernbank Science Center 3:00PM.**
- Apr 16th-19th, Thursday-Sunday: **AAC Zombie Party at DAV.**
- Apr 18th, Saturday: New Moon. **CEA Meeting.**
- Apr 21st, Tuesday: Moon near Venus.
- Apr 22nd, Wednesday: Mercury near Mars.
- Apr 25th, Saturday: Moon First Quarter.
- May 5th, Tuesday: Full Moon.
- May 9th, Saturday: **AAC Meeting at Fernbank Science Center 3:00PM.**
- May 11th, Monday: Moon Last Quarter.
- May 16th, Saturday: **CEA Meeting.**

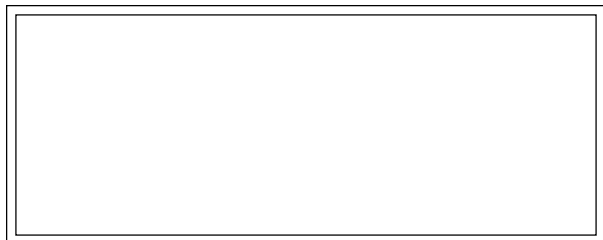
For more event listings see the calendar at www.atlantaastronomy.org

Atlanta Astronomy Club Listserv

Subscribe to the Atlanta Astronomy Club Mailing List: The name of the list is: AstroAtlanta. The address for messages is: AstroAtlanta@yahoogroups.com . To add a subscription, send a message to: AstroAtlanta-subscribe@yahoogroups.com .

Focal Point Deadline and Submission Information

Please send articles, pictures, and drawings in electronic format on anything astronomy, space, or sky related to Tom Faber at focalpoint@atlantaastronomy.org. Please send images separate from articles, not embedded in them. Articles are preferred as plain text files but Word documents or PDF's are okay. You can submit articles anytime up to the deadline. **The deadline for April is Saturday, March 21. Submissions after the deadline will go in the following issue.**



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

Newsletter of The Atlanta Astronomy Club, Inc.

The Focal Point



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