

The Focal Point

The Atlanta Astronomy Club
Established 1947
June 2015

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Editor: Tom Faber

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June General Meeting & Elections

Please join us for the next meeting of the Atlanta Astronomy Club, to be held on Saturday, June 13th 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. Our featured speaker will be Philip Sacco. Philip will present a talk about the mythology of the night sky.

We will again try to hold elections for club officers and board members (Since we didn't have a quorum at the May meeting we could not hold elections). Members please attend the June meeting if possible so we will have a quorum for the elections.

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

Speaker Bio

After a renewed childhood interest in Astronomy in the early 1990s, Phil joined the Atlanta Astronomy Club and went on to become an officer of the Atlanta Astronomy Club, serving as President twice, and Vice President of Observing once. Under his direction, the AAC revitalized its observing location in Villa Rica and regularly began stressing new member training and public viewing. Under his leadership, the AAC experienced the greatest growth in its history, swelling from mid 100's to well over 400. Phil also served on a national scale as the Southeast Regional Director of the Astronomical League for more than six years. Today, Phil is the eleventh person to earn the title of Master Observer, one given to those individuals who complete 10 Astronomical League observing programs. There are currently some 160 Master Observers in the United States.

Today, Phil enjoys traveling to various conventions in the south east as well as star parties to give talks and share his passion for among other things, stellar mythology.

Phil isn't a Georgia native, but got here as fast as he could. Born in New York, at a very young age Phil moved to Georgia as a young boy,



eventually earning degrees at Augusta University and Medical College of Georgia, School of Dentistry, graduating summa cum laude. When not talking about or observing the night sky, Phil enjoys making mead using a 2000 year old Roman recipe and performing as a magician.

His program this month will be a bit of a mythology primer for those new to this type of presentation and will feature the mythology of specific constellations of the season. Prepare to be overwhelmed-!

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: July 11, Aug 8, & Sept 12.

Woodruff Scout Summer Camp

Woodruff's Boy Scout Summer Camp program begins in June. This is not only our time to "pay the rent" for our use of Woodruff as a Dark Sky site, but also our best opportunity to fulfill our Club mandate to "educate" and "to promote the public knowledge of and interest in astronomy". Our on-field viewing with the scopes will be on Thursday nights, after dark (from 9:00 – 11 p.m.) You can bring your own telescope or one from the warm-up shed. We are asking for Club members to volunteer to help out on one or more evenings this summer, on Thursday nights, from June 4 – July 23. Please phone or e-mail me [Sharon Carruthers, scarruthers@AtlantaAstronomy.org 770-941-4640 (h)] or Daniel Herron (Observing@AtlantaAstronomy.org) if you can commit to one or more evenings.

May AAC General Meeting Report

By Alan Coffelt, AAC Recording Secretary.

Photos by Tom Faber.

This month's general meeting was on Saturday, May 9th starting at 3pm at the Fernbank Science Center. There were 28 members and guests present for the meeting.

Our speaker was AAC Observing Chair Daniel Herron, who talked about the International Space Station's history, construction, missions, and its future.

The ISS serves as a microgravity and space environment research laboratory in which crew members conduct experiments in biology, human biology, physics, astronomy, meteorology and other fields. The station is suited for the testing of spacecraft systems and equipment required for missions to the Moon and Mars (From Wikipedia).

Following are highlights from the talk:

Daniel began by showing a series of time-lapse videos that were taken from aboard the ISS that featured beautiful day and night views of the earth from orbit. Next, he described how the ISS came to be, and how several space agencies eventually came together to make it happen, often with revised plans based on their original ambitions to build their own space stations for various purposes. Along the way, Daniel also pointed out when geopolitical changes and world events reshaped many aspects of the international program.

Of the 16 nations involved, the major contributors included space agencies from the United States, Russia, Japan, Europe, and Canada. Involving the best each country had to offer, it meant that a more capable platform was possible, and would include new extras that could be shared, along with the costs. For example, a science module with labs would be added by Japan, the only major contributor originally planning to place such facilities in orbit.

The ISS is the largest structure ever built in space and involved over 100,000 people to design, build, launch, and assemble the components. The U.S., (using 37 shuttle missions) and Russians (using 89 Soyuz and Proton rockets) launched most of components into orbit. Daniel showed an animation of the assembly from 1998 through 2011 and explained what each of the major segments did and which agency provided it. He then shared several pictures of the ISS taken from departing spacecraft.

Daniel next shared several interesting facts about the ISS. For example, the ISS today is over 1 million pounds of mass (the equivalent to two 747 jetliners) and is as large as a football field, including the end zones, when you include the truss and solar panels. The habitable part is about the equivalent of a five bedroom house.

In the next part of the talk, Daniel showed us what activities the astronauts perform on the ISS. One part of the ISS mission, for example, is educational outreach. We watched a video of Canadian astronaut, Chris Hadfield, who demonstrated the effect of microgravity on water being wrung out from a washcloth, which was both fascinating and entertaining. He also listed some of the benefits of research done for and from the ISS, including advances in air and water purification, fluid flow experiments, crystal formation, materials research, pharmaceutical delivery technology, and robotics, to name a few.

The ISS future is evolving. The American and Russian programs are funded through 2024, but the Russians are proposing building a successor for the ISS called (OPSEC) using some of the Russian components from the ISS. This hasn't been confirmed by NASA, but something to watch. NASA is hoping Congress will extend funding for the ISS until at least 2028. One new mission that started this year involves studying the health and psychological effects of long-term habitation in space using twin astronauts Scott and Mark Kelly. They will compare Mark (on earth) with his

brother, Scott, who is living on the ISS for an entire year.

Daniel finished his talk with some resources and tips that will help you observe the ISS as it passes overhead (heavens-above.com) and recommended books by Chris Hadfield about the challenges of living in space on the ISS. We also watched a music video of Chris (produced by his son) playing on the guitar and singing the David Bowie song, *Space Oddity*, from the ISS, which was certainly entertaining.

After the talk, there were club announcements about upcoming events and an invitation to join the club for guests who are interested. For future speaker programs and upcoming club event details and observing programs, see the club calendar.



The Charlie Elliott Summer Schedule

Join us for “Summer Under the Stars” at Charlie Elliott! Instead of regular meetings or potlucks this summer, the Charlie Elliott Chapter will be hosting monthly stargazing sessions at the Jon Wood Astronomy Field in Mansfield, GA on the nights of June 20, July 18, and August 22 weather permitting. Members and visitors are invited to the field for observing, beginning about 30 minutes before sundown. Bring your telescopes and come enjoy the night sky! If you’d like, you may bring a sack supper to picnic around the edges of the field before sundown. Hosts for these stargazing sessions will be interim co-directors Jack Fitzmier and Marie Lott. A “Walk and Talk” to point out the summer constellations and planets will be held once the skies darken. No Chapter business will be conducted, except as outlined below, until the next regular meeting of the Charlie Elliott Chapter, which will be held on September 19 with a potluck supper and general elections. Meeting place and time of that gathering will be announced at a later date.

Leadership Transition

The Board of the Charlie Elliott Chapter has accepted a proposal from Marie Lott and Jack Fitzmier to provide interim leadership and summer programming until the fall, when the Chapter will elect new Officers, including Chapter Director, Observing Supervisor, and Recording Secretary. Marie and Jack have two goals for this interim period. First, they will provide the leadership necessary for the Chapter to continue, uninterrupted, our monthly observing sessions on Jon Wood Field (see above). Members and guests are welcome to join the Chapter on the field about 30 minutes before sundown. Marie and Jack, and other volunteers they enlist, will provide some “Walk and Talk” tours of the night skies. Otherwise, it’s time behind the eyepiece! Second, Marie and Jack will serve as a Nominations Committee, and will form a slate of candidates for Chapter Director, Observing Supervisor, and Recording Secretary, to be voted on at the September 19 Potluck and Chapter Meeting (time and place TBD). They will consult broadly with the CE membership to form the slate of candidates, and will also consult with members about possible adjustments to our Chapter bylaws. Open meetings for discussion will be scheduled in advance of the September meeting as necessary. If you have interest in assisting Marie and Jack over the summer, or if you have questions, please contact either of them at lott.marie@gmail.com or jfitzmier@gmail.com.

Upcoming DSO Dates and Locations

These are the dates for the next few AAC Dark Sky Observing events. All of these events are scheduled at Grier’s Field at the Deerlick Astronomy Village: June 20, July 18, Aug 15. DSOs will usually be on the weekend closest to new moon. The locations and dates of the DSOs may change - check the AAC web page for 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>

A Trip to Oz

By Alex Langoussis, Photos by Alex Langoussis unless noted otherwise
Imagine... stepping out from your comfortable room into the night. A 7.0 limiting magnitude night. And above you the Sagittarius-Scorpius center of the Milky is straight overhead, so bright that its dark molecular clouds look like rips in the fabric of the sky. Imagine further that in front of you are a dozen telescopes ranging in size from 14 to 30 inches, awaiting your use. And even more, a large group of experienced Aussie astronomers are there to guide you through the celestial maze.

Yes, you are in Oz. OzSky actually, arguably the best star party in the world. This past April, Nelda and I had the pleasure of attending the 12th annual version of this event. Tucked on about 20 acres in the Warrumbungles (Crooked Mountains) region of New South Wales, Australia, just down the road from Siding Spring Observatory, this star party’s aim is to provide about three dozen northern astronomers each year the opportunity to view the best the southern night sky (whole sky really) has to offer, with excellent large-aperture telescopes one would never otherwise be able to transport. OzSky certainly delivers on this promise.

The celestial views are of the kind which you will remember for a lifetime. A few of the best...

The Milky Way Galaxy. With the center overhead, it casts a shadow. Dark nebulae are prominent to the point that one can create constellations from them, such as the celestial Emu.

The Large and Small Magellanic Clouds. Satellite galaxies of our own, they are big and bright. The LMC is as large as the bowl of the Big Dipper!

Eta Carinae Nebula, with the Homunculus. In the 4+ degree field in my 85mm refractor, the Orion Nebula took up about a quarter of the field. Swinging the scope over to Eta, the nebula was not only brighter and more detailed, but so large that it extended out beyond the edge of the field. Zooming in on Eta (the star) with larger aperture, at 700x we could see not only the bipolar nebula created when the star underwent eruptions in the 1800s, but details within that nebula itself, with irregular dark patches evident.

The Tarantula Nebula. A hundred times further away than Orion (in the LMC), yet covering four times more area in our sky, this massive star forming region is a lovely mix of bright, wispy nebulosity, “dark bubbles”, and a healthy dose of stars mixed in; probably the best deep sky object there is (after our own Milky Way).

47 Tucanae. A bright, densely packed globular that dwarfs the Hercules Cluster. So bright it’s an obvious “star” next to the SMC, it seems to be most southerners’ favorite globular.

Omega Centauri. Another great globular (possibly the remnant of the core of a torn up dwarf galaxy.) Not as dense looking as 47 Tuc, but absolutely huge and impressive nonetheless, with its own distinctive look, appearing almost three dimensional with numerous star chains. Those who don’t favor 47 Tuc usually call this their favorite cluster. (Sort of like the difference between Coke and Pepsi drinkers.)

The Southern Cross, with Alpha and Beta Centauri and the Coal Sack. The two pointer stars with the Cross are probably the most beautiful grouping of bright stars in the heavens, and the dark nebula, looking like a hole punched in the sky, adds contrast to show just how dense a star region this is. (This area of sky is especially striking when viewed from a balcony between palms trees aside the Coral Sea!)

Of course, these objects are just a few of many southern treasures available for viewing from OzSky. Though some of them can be glimpsed from

Continued on next page

further north, they show much better when they're high overhead from southern hemisphere latitudes.

Adding to the OzSky experience, there are enjoyable daytime activities available as well. Besides trips to nearby astronomical sites, being next to a national park there are plenty of opportunities for hiking, birding, and other activities. For relaxation, hang out down the road in one of Coonabarabran's bakeries or pubs. Or, if you decide to stay and relax on the grounds, eventually groups of emus, kangaroos, and cockatoos will make their presence known.

If you are reading this newsletter, it probably means that you have a strong interest in astronomy. If that is the case, then you owe it to yourself at some point to travel south to see the best the night sky has to offer. OzSky offers you a wonderfully easy and comfortable way to do this. Put it on your bucket list, then do it. (Then put it back on your bucket list!) You will not regret it.



The photo above is of the Milky Way rising above the scopes on the observing field. The top right photo is of the dark-nebula constellation Emu. (The head is the Coalsack; can you see it?) Both these photos were taken by Lachlan Macdonald.



What's "wrong" with this sundial? The answer is on page 7.



Telescopes dutifully awaiting the guests' arrival from dinner. Even when everyone was on the field, there normally weren't more than 3 people per telescope.

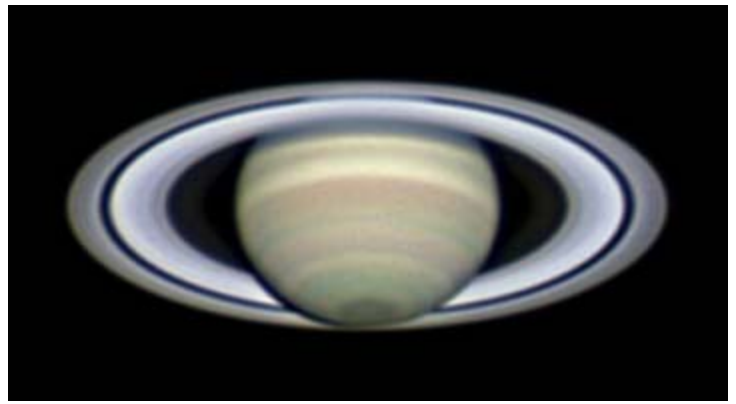
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A visit to a nearby radio telescope. Watch your speed (and watch for kangaroos too!). The sign wasn't kidding!

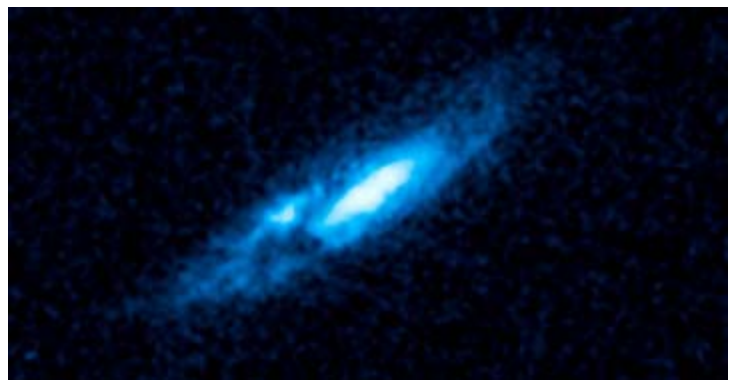


Connabarabran is considered the "Astronomy Capital of Australia". As an example of how the entire community supports astronomy, here is a picture I took of a changing room in a clothing shop!...



Saturn by Alan Coffelt

Alan Coffelt took this great image of Saturn on May 3rd at the Deerlick Astronomy Village. Alan used his C11 telescope and a color ZWO ASI120 camera. The image was made at 5:00.8 UT under very good seeing conditions.



Hubble Observes One-of-a-Kind Star Nicknamed 'Nasty'

NASA/STScI News Release - May 21, 2015

This visible-light image taken by NASA's Hubble Space Telescope reveals a pancake-shaped disk of gas around an extremely bright star in our Milky Way galaxy. The disk glows brightly in the light of ionized nitrogen.

The central star is nicknamed "Nasty 1," derived from its catalog name of NaSt1. Nasty 1 is thought to be a Wolf-Rayet star, a massive, rapidly evolving star weighing well over 10 times the mass of our sun. The star is losing its hydrogen-filled outer layers quickly, exposing its super-hot and extremely bright helium-burning core.

Nasty 1 is thought to have a companion, and gravitational interactions between them may have created the gas disk. Both stars are heavily obscured by gas and dust in the disk. Hubble observations suggest that as Nasty 1 sheds its weight, some of the mass is falling onto a companion star and some is leaking into space, forming the disk. The vast structure is nearly 2 trillion miles wide. The disk is clumpy because astronomers think the outbursts occur sporadically. The knot at left of center is an unusually bright clump of gas. The image is tinted blue to bring out details in the disk.

Astronomers were surprised to find the disk-like structure, which has never been seen before around a Wolf-Rayet star in our galaxy. The star may represent a brief transitory stage in the evolution of massive stars.

The observations were taken in April 2013 with the Wide Field Camera 3. Credit: NASA, ESA, and J. Mauerhan (University of California, Berkeley)



Countdown to Pluto

Encounter - 1 Month

May 28, 2015 — So Far, All Clear: New Horizons Team Completes First Search for Pluto System Hazards

NASA's New Horizons team has analyzed the first set of hazard-search images of the Pluto system taken by the approaching spacecraft itself – and so far, all looks clear for the spacecraft's safe passage.

The observations were made May 11-12 from a range of 47 million miles (76 million kilometers) using the telescopic Long Range Reconnaissance Imager (LORRI) on New Horizons. For these observations, LORRI was instructed to take 144 10-second exposures, designed to allow a highly sensitive search for faint satellites, rings or dust sheets in the system. The mission team is looking carefully for any indications of dust or debris that might threaten New Horizons before the spacecraft's flight through the Pluto system on July 14; a particle as small as a grain of rice could be fatal.

The observations, downlinked to Earth May 12-15 and processed and analyzed May 12-18, detected Pluto and all five of its known moons, but no rings, new moons, or hazards of any kind. The New Horizons hazard detection team, led by John Spencer of the Southwest Research Institute in Boulder, Colorado, determined that small satellites with about half the brightness of Pluto's faintest known moon, Styx, could have been detected at this range. Any undiscovered moons outside the orbit of Pluto's largest and closest moon, Charon, are thus likely smaller than 3-10 miles (5-15 kilometers) in diameter. If any undiscovered rings are present around Pluto outside Charon's orbit, they must be very faint or narrow – less than 1,000 miles wide or reflecting less than one 5-millionth of the incoming sunlight.

The next hazard-search images will be taken May 29-30, and should have about twice the sensitivity of the first batch. The team expects to complete a thorough analysis of the data and report on its results by June 12. The New Horizons team has until July 4 to divert the spacecraft to one of three alternate routes if any dangers are found.

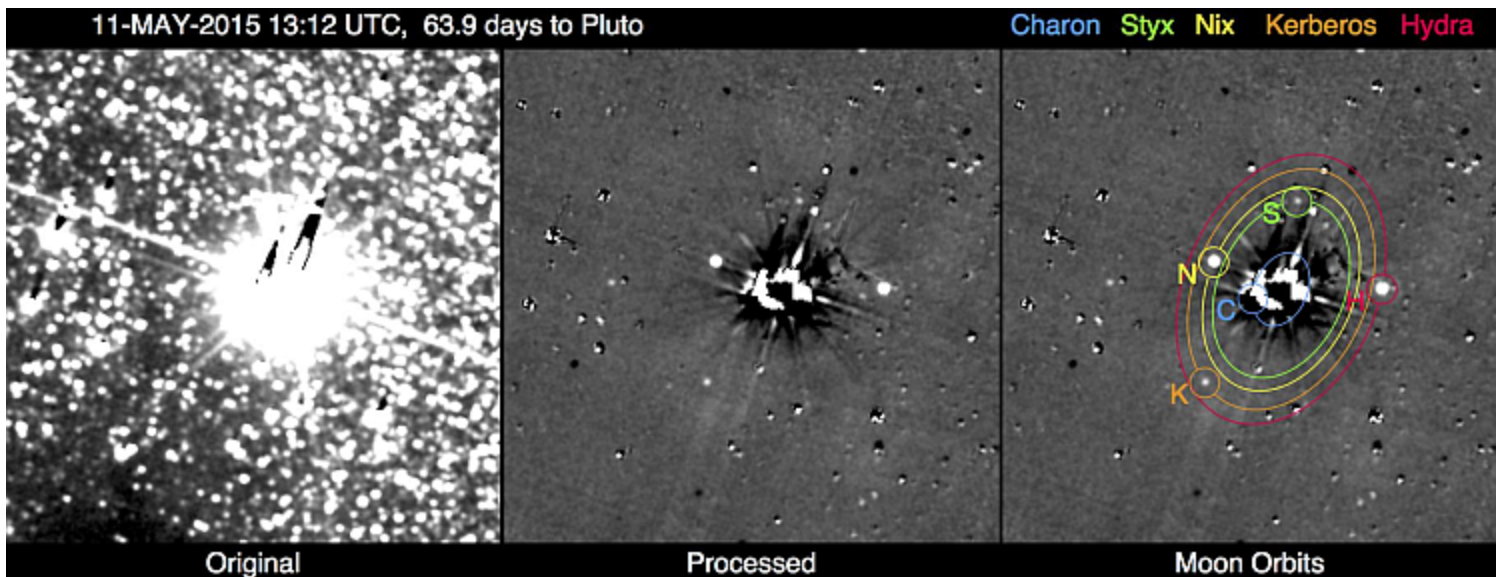
New Horizons is nearly 2.95 billion miles from home, speeding toward Pluto and its moons at just under 750,000 miles per day. The spacecraft is healthy and all systems are operating normally.

The Johns Hopkins University Applied Physics Laboratory in Laurel, Maryland, designed, built, and operates the New Horizons spacecraft, and manages the mission for NASA's Science Mission Directorate. Southwest Research Institute, San Antonio and Boulder, Colorado, leads the science team, payload operations and encounter science planning. New Horizons is part of the New Frontiers Program managed by NASA's Marshall Space Flight Center in Huntsville, Alabama.

This image shows the results of the New Horizons team's first search for potentially hazardous material around Pluto, conducted May 11-12, 2015, from a range of 76 million kilometers. The image combines 48 10-second exposures, taken with the spacecraft's Long Range Reconnaissance Imager (LORRI), to offer the most sensitive view yet of the Pluto system.

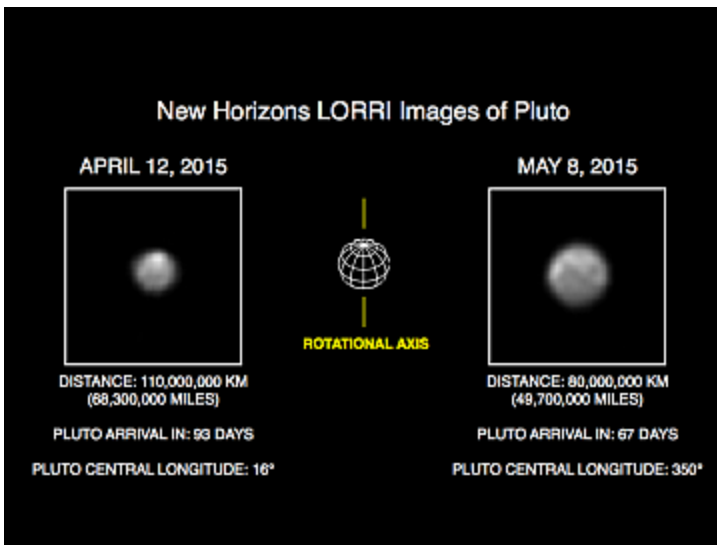
The left panel is a combination of the original images before any processing. The combined glare of Pluto and its large moon Charon in the center of the field, along with the thousands of background stars, overwhelm any faint moons or rings that might pose a threat to the New Horizons spacecraft.

The central panel is the same image after extensive processing to remove Pluto and Charon's glare and most of the background stars, revealing Pluto's four small moons — Styx, Nix, Kerberos and Hydra — as points of light. The right panel overlays the orbits and locations of all five moons, including Charon. Remaining unlabeled spots and blemishes in the processed image are imperfectly removed stars, including variable stars which appear as bright or dark dots. The faint grid pattern is an artifact of the image processing. Celestial north is up in these images.



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>.



These images show Pluto in the latest series of New Horizons Long Range Reconnaissance Imager (LORRI) photos, taken May 8-12, 2015, compared to LORRI images taken one month earlier. In the month between these image sets, New Horizons' distance to Pluto decreased from 110 million kilometers to 80 million kilometers, as the spacecraft speeds toward a close encounter with the Pluto system in mid-July.

The April image is shown on the left, with the May image on the right. They have been rotated to align Pluto's rotational axis with the vertical direction, as depicted schematically in the center panel. Between April and May, Pluto appears to get larger as the spacecraft gets closer, with Pluto's apparent size increasing by approximately 50 percent.

These images are displayed at four times the native LORRI image size, and have been processed using a method called deconvolution, which sharpens the original images to enhance features on Pluto. Deconvolution can occasionally add "false" details, so the finest details in these pictures will need to be confirmed by images taken from closer range in the next few weeks. The images are displayed using the same linear brightness scale. Credit NASA/JHU/APL.

What's "wrong" with this sundial? Since it's in the southern hemisphere the hour numbers run the opposite way from those on a sundial in the northern hemisphere. And the gnomon points south rather than north.

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.

AAC Officers and Contacts

President: Mark Banks President@AtlantaAstronomy.org

Program Chair: Richard Jakiel Programs@AtlantaAstronomy.org

Observing Chair: Daniel Herron Observing@AtlantaAstronomy.org

Corresponding Secretary: Tom Faber
Focalpoint@AtlantaAstronomy.org

Treasurer: Sharon Carruthers Treasurer@AtlantaAstronomy.org

Recording Secretary: Alan Coffelt,
Secretary@AtlantaAstronomy.org

Board Chair: Sharon Carruthers Treasurer@AtlantaAstronomy.org

Board: Brigitte Fessele, Contact info TBA

Board: David Lumpkin, Contact info TBA

Board: Steve Phillips sandsphillips@att.net

ALCor: Jamie Anderson, jameia@bellsouth.net

Elliott Chapter Director: Steve Siedentop
director@ceastronomy.org

Elliott Observing Supervisor: John Towne
observing@ceastronomy.org

Elliott Recording Secretary: Van Macatee
secretary@ceastronomy.org

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

Elliott Webmaster: Position Open webmaster@CEastronomy.org

Elliott Outreach Coordinator: Valorie Whalen
outreach@ceastronomy.org

Georgia Astronomy in State Parks: Sharon Carruthers
Treasurer@AtlantaAstronomy.org

PSSG Chairman: Peter Macumber pmacumber@nightsky.org

PSSG Co-Chair: Open

Sidewalk Astronomy: Brad Isley
sidewalkastronomy@AtlantaAstronomy.org

Light Trespass: Ken Edwards, Contact info TBA

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

AAC Webmaster: Daniel Herron
Observing@AtlantaAstronomy.org

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

AAC Events are listed in BOLD

- June 1st, Monday: Venus near Pollux & Castor.
- June 2nd, Tuesday: Full Moon.
- June 6th, Saturday: Venus at Greatest Eastern Elongation.
- June 9th, Tuesday: Moon Last Quarter.
- June 12th, Friday: Venus near Beehive.
- June 13th, Saturday: **AAC Meeting at Fernbank Science Center 3:00PM**
- June 14th, Sunday: Mars conjunction with Sun. Earliest Sunrise (~6:25AM at Atlanta).
- June 16th, Tuesday: New Moon.
- June 20th, Saturday: **Observing at the Jon Wood Astronomy Field.** Grouping of Moon, Venus, & Jupiter.
- June 21st, Sunday: Summer Solstice at 12:38PM.
- June 24th, Wednesday: Moon First Quarter. Mercury at Greatest Western Elongation.
- June 27th, Saturday: Latest Sunset (~8:52PM at Atlanta).
- June 28th, Sunday: Moon near Saturn.
- June 30th, Tuesday: Venus & Jupiter only 1/3 degree apart!!
- July 1st, Wednesday: Full Moon.
- July 6th, Monday: Pluto at Opposition. Earth at aphelion at 3:41PM.
- July 8th, Wednesday: Moon Last Quarter.
- July 11th, Saturday: **AAC Meeting at Fernbank Science Center 3:00PM.**
- July 15th, Wednesday: New Moon.
- July 18th, Saturday: **Observing at the Jon Wood Astronomy Field.**
- July 23rd, Thursday: Mercury at Superior Conjunction.
- July 24th, Friday: Moon First Quarter.
- July 25th, Saturday: Ceres at Opposition.

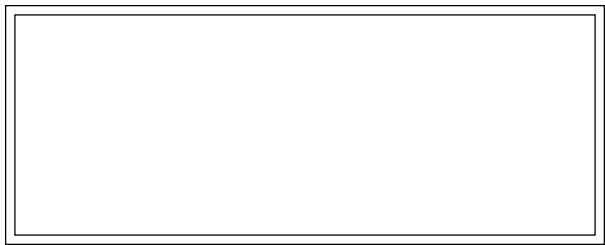
For more event listings see the calendar at www.atlantaastronomy.org

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 July is Saturday, June 20. Submissions after the deadline will go in the following issue.**



FIRST CLASS



www.betage.com



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

Newsletter of The Atlanta Astronomy Club, Inc.



Tom Faber
2206 Treeridge Parkway
Alpharetta, GA 30022

Atlanta Astronomy Club

P.O. Box 76155

Atlanta, GA 30358-1155

www.atlantaastronomy.org

On Twitter at <http://twitter.com/atlastro>