

# The Focal Point

The Atlanta Astronomy Club  
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Editor: Tom Faber

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## Charlie Elliott June Potluck Dinner and Observing

**This Month** — Come for the food, stay for the stars! Join us at 7 p.m. on Saturday, June 17, 2023, at the Charlie Elliott Wildlife Center Campbell Aquatics Building (see map) for our quarterly potluck! If you've already been to one of our potlucks, you're probably already looking forward to the good food and company that these events have become known for. Please note that besides your donations of the usual comfort foods like banana pudding, mac & cheese, barbecue, and so forth, we'll also need help with set-up and clean-up.

Also note that by agreement of the current officers, we've postponed the annual election for officers until this evening so as to have a more representative crowd of club members.

Our potlucks are only as good as we make them. And while it's not required, it's a good idea to know who's bringing what, so if possible, please click on the link below to sign up and help out!

<https://bit.ly/CEpotluckRSVP>

**Meeting Agenda** — First, we'll have opening remarks and general introductions by CE Astronomy Chapter Director Steve Siedentop for the benefit of newcomers. Following that will be a vote for the next set of officers, including Chapter Director, Observing Supervisor and Chapter Secretary; nominations from the floor will be accepted prior to the actual vote that evening. Next will be announcement of the voting results and then DINNER!

We'll also feature a presentation of what's up in the sky this (and part of next) month by former Observing Supervisor Dave Whalen (current Observing Supervisor Dennis Ruzeski cannot be with us this evening).



**Location, Location, Location** — To find the Jon Wood Astronomy Field: Head to Mansfield on Hwy 11, Turn off Hwy 11 onto Marben Farm Road (just south of Mansfield), Turn right onto Elliott Trail, Go a short distance, then turn right onto the dirt driveway that leads up to the Jon Wood Astronomy Field.

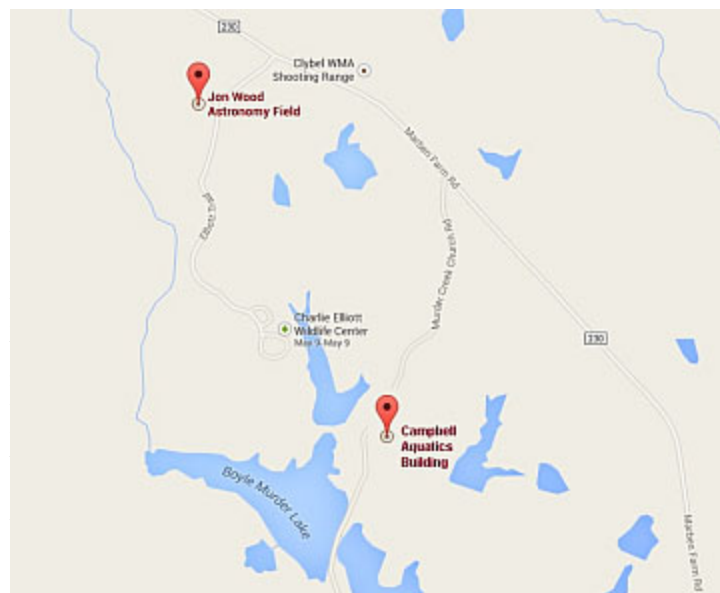
### Observing on the Jon Wood Astronomy Field

Please refrain from using white lights on the observing field to preserve night vision. Red lights are readily available at department and sporting goods stores in the Atlanta area. As stated above all are invited, however, to bring their own telescopes or binoculars or at least their interest in astronomy. For more information about Charlie Elliott Wildlife Center, visit: <https://georgiawildlife.com/charlie-elliott-wildlife-center>

### A Few Items to Note...

Plan to treat this outing like you would a camping trip and be prepared. Dress appropriately for the weather and the environment, bring snacks and drinks if needed, and plan to take your garbage with you. There is a regularly serviced Porta-Potty on Jon Wood Astronomy Field.

The main gate on Elliott Trail closes to new entry at 7 p.m., but will automatically open for exiting traffic at all times. Therefore, if you plan to observe on the Jon Wood Astronomy Field, please arrive before 7 p.m. or else make arrangements with a club member for access.



Credit: Google Maps

Continued on next page.

## Our Monthly Meetings and Public Observing Nights

Our monthly meetings and public observing nights are free and open to the public. Visit the “Our Calendar” tab at the top of the page for our 2023 meeting, observing, and outreach schedule. Start times vary through the year so please check back for details.

View our Full Calendar of all meetings & outreach events here:

<http://ceastronomy.org/blog/outreach/charlie-elliott-astronomy-calendar>

It's easy to become a member of Charlie Elliott Astronomy!

Pay dues with PayPal here: <http://atlantaastronomy.org/membership/>

## March was 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 2023 by the end of March. Please, if you have not already done so, send your renewals to AAC Treasurer Sharon Carruthers, or renew online using PayPal. For more information see:

[http://atlantaastronomy.org/?page\\_id=22](http://atlantaastronomy.org/?page_id=22)

***Thank You for your support of the AAC!***

## Supernova in M101 by Clay Turner

This image of SN 2023 IXF was taken on May 27, 2023





## The Full Moon by Clay Turner

This image of the full moon was shot around 3:40 UT on June 4, 2023.

100 shots were taken and the best 50 were stacked and processed to make the image (AutoStackert3 and Registax). This was the time the moon was fullest this month.

Subframes were 3mSec each. Camera is an ASI2400MC Pro. 1x1 binning (0.487" per pixel) was used. The image was 3979 pixels high on a 6072 by 4042 pixel sensor. Thus the image just fit on the sensor.

The scope is an early model orange tube C14 fitted with a Starizona LF field flattener/focal reducer on a CGX mount. The focal reducer brings the scope down to around F/7.3 from its native F/11.

Summer full moons don't rise very high compared to winter full moons, so seeing is exacerbated. In this case the Moon was 25 degrees above the horizon meaning we were observing at around 2.4 airmasses.



## Galaxies M88 and M91 by Richard Jakiel

Richard made this image of the barred spiral M 91 (left) and the spiral M88 (right) from his suburban home using a 6-inch Ritchey–Chrétien telescope. For more information about M88 and M91 see: [https://en.wikipedia.org/wiki/Messier\\_88](https://en.wikipedia.org/wiki/Messier_88) and [https://en.wikipedia.org/wiki/Messier\\_91](https://en.wikipedia.org/wiki/Messier_91)

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## A Dark Central Mass is Lurking at the Hub of a Glittering Stellar Island

NASA/STScI News Release - Mat 23, 2023

Astronomers using NASA’s Hubble Space Telescope have come up with what they say is some of their best evidence yet for the presence of a rare class of “intermediate-sized” black hole that may be lurking in the heart of the closest globular star cluster to Earth, located 6,000 light-years away.

Like intense gravitational potholes in the fabric of space, virtually all black holes seem to come in two sizes: small and humongous. It’s estimated that our galaxy is littered with 100 million small black holes (several times the mass of our Sun) created from exploded stars. The universe at large is flooded with supermassive black holes, weighing millions or billions of times our Sun’s mass and found in the centers of galaxies.

A long-sought missing link is an intermediate-mass black hole, weighing in somewhere between 100 and 100,000 solar masses. How would they form, where would they hang out, and why do they seem to be so rare?

Astronomers have identified other possible intermediate-mass black holes through a variety of observational techniques. Two of the best candidates — 3XMM J215022.4-055108, which Hubble helped discover in 2020, and HLX-1, identified in 2009, reside in dense star clusters in the outskirts of other galaxies. Each of these possible black holes has the mass of tens of thousands of suns, and may have once been at the centers of dwarf galaxies. NASA’s Chandra X-ray observatory has also helped make many

possible intermediate black hole discoveries, including a large sample in 2018.

Looking much closer to home, there have been a number of suspected intermediate-mass black holes detected in dense globular star clusters orbiting our Milky Way galaxy. For example, in 2008, Hubble astronomers announced the suspected presence of an intermediate-mass black hole in the globular cluster Omega Centauri. For a number of reasons, including the need for more data, these and other intermediate-mass black hole findings still remain inconclusive and do not rule out alternative theories.

Hubble’s unique capabilities have now been used to zero in on the core of the globular star cluster Messier 4 (M4) to go black-hole hunting with



*A Hubble Space Telescope image of the globular star cluster, M4. Credit: ESA/Hubble, NASA, Eduardo Vitral (STScI)*

*Continued on page 7.*



## NGC 1491 by Dan Llewellyn

NGC 1491 also known as the fossil footprint nebula. This emission nebula lies in the Perseus arm of our Milky Way galaxy and of course is in the constellation Perseus. It is approximately 11,000 light years away. You can see why it's called the fossil footprint, as it resembles a dinosaur footprint. The heel is the bright white and red part and the 3 claw toes go out to the left (dimmer red) to the edge of the picture. Stack of 54-123 second subs on my Esprit 150 APO with a Sony A7s and an OPT QUAD filter. Taken on December 16th 2022.

For more information about NGC 1491 see: [https://en.wikipedia.org/wiki/NGC\\_1491](https://en.wikipedia.org/wiki/NGC_1491)

## Atmospheric Optics on Mars - Crepuscular Rays and Iridescent Clouds

The veteran rover captured a dazzling sunset at the start of a new cloud-imaging campaign.

Martian sunsets are uniquely moody, but NASA's Curiosity rover captured one last month that stands out. As the Sun descended over the horizon on Feb. 2, rays of light illuminated a bank of clouds. These "sun rays" are also known as crepuscular rays, from the Latin word for "twilight." It was the first time sun rays have been so clearly viewed on Mars.

Curiosity captured the scene during the rover's newest twilight cloud survey, which builds on its 2021 observations of noctilucent, or night-shining, clouds. While most Martian clouds hover no more than 37 miles (60 kilometers) above the ground and are composed of water ice, the clouds in the latest images appear to be at a higher altitude, where it's especially cold. That suggests these clouds are made of carbon dioxide ice, or dry ice.

As on Earth, clouds provide scientists with complex but crucial information for understanding the weather. By looking at when and where clouds form, scientists can learn more about the Martian atmosphere's composition and temperatures, and the winds within it.

The 2021 cloud survey included more imaging by Curiosity's black-and-white navigation cameras, providing a detailed look at a cloud's structure as it moves. But the recent survey, which began in January and will wrap up in mid-March, relies more often on the rover's color Mast Camera, or Mastcam, which helps scientists see how cloud particles grow over time.

In addition to the image of sun rays, Curiosity captured a set of colorful clouds shaped like a feather on Jan. 27. When illuminated by sunlight, certain types of clouds can create a rainbowlike display called iridescence.

"Where we see iridescence, it means a cloud's particle sizes are identical to their neighbors in each part of the cloud," said Mark Lemmon, an atmospheric scientist with the Space Science Institute in Boulder, Colorado. "By looking at color transitions, we're seeing particle size changing across the cloud. That tells us about the way the cloud is evolving and how its particles are changing size over time."

Curiosity captured both the sun rays and iridescent clouds as panoramas, each of which was stitched together from 28 images sent to Earth. The images have been processed to emphasize the highlights.



*NASA's Curiosity Mars rover captured these "sun rays" shining through clouds at sunset on Feb. 2, 2023, the 3,730th Martian day, or sol, of the mission. It was the first time that sun rays, also known as crepuscular rays, have been viewed so clearly on Mars.*

*Credits: NASA/JPL-Caltech/MSSS/SSI*



*This feather-shaped iridescent cloud was captured just after sunset on Jan. 27, 2023, the 3,724th Martian day, or sol, of Curiosity's mission. Studying the colors in iridescent clouds tells scientists something about particle size within the clouds and how they grow over time. Credits: NASA/JPL-Caltech/MSSS*

higher precision than in previous searches. “You can’t do this kind of science without Hubble,” said Eduardo Vitral of the Space Telescope Science Institute in Baltimore, Maryland, lead author on a paper to be published in the Monthly Notices of the Royal Astronomical Society.

Vital’s team has detected a possible intermediate-mass black hole of roughly 800 solar masses. The suspected object can’t be seen, but its mass is calculated by studying the motion of stars caught in its gravitational field, like bees swarming around a hive. Measuring their motion takes time, and a lot of precision. This is where Hubble accomplishes what no other present-day telescope can do. Astronomers looked at 12 years’ worth of M4 observations from Hubble and resolved pinpoint stars.

His team estimates that the black hole in M4 could be as much as 800 times our Sun’s mass. Hubble’s data tend to rule out alternative theories for this object, such as a compact central cluster of unresolved stellar remnants like neutron stars, or smaller black holes swirling around each other.

“We have good confidence that we have a very tiny region with a lot of concentrated mass. It’s about three times smaller than the densest dark mass that we had found before in other globular clusters,” said Vitral. “The region is more compact than what we can reproduce with numerical simulations when we take into account a collection of black holes, neutron stars, and white dwarfs segregated at the cluster’s center. They are not able to form such a compact concentration of mass.”

A grouping of close-knit objects would be dynamically unstable. If the object isn’t a single intermediate-mass black hole, it would require an estimated 40 smaller black holes crammed into a space only one-tenth of a light-year across to produce the observed stellar motions. The consequences are that they would merge and/or be ejected in a game of interstellar pinball.

“We measure the motions of stars and their positions, and we apply physical models that try to reproduce these motions. We end up with a measurement of a dark mass extension in the cluster’s center,” said Vitral. “The closer to the central mass, more randomly the stars are moving. And, the greater the central mass, the faster these stellar velocities.”

Because intermediate-mass black holes in globular clusters have been so elusive, Vitral cautions, “While we cannot completely affirm that it is a central point of gravity, we can show that it is very small. It’s too tiny for us to be able to explain other than it being a single black hole. Alternatively, there might be a stellar mechanism we simply don’t know about, at least within current physics.”

The **Atlanta Astronomy Club, Inc.**, one of the South’s largest and oldest astronomical society, meets at **3:00 P.M.** on the 3rd 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](mailto: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 posted. 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/atlaastro>.

### AAC Officers and Contacts

**President:** Dave Lumpkin [President@AtlantaAstronomy.org](mailto:President@AtlantaAstronomy.org)

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**Board:** Open

**Board:** Steve Phillips [sandsphillips@att.net](mailto:sandsphillips@att.net)

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**Elliott Astrophotography Coordinator:** Mike Mardis

**Elliott Chapter AL Liaison:** David Whalen

**Elliott Facilities Coordinator:** Matt Harvey  
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**PSSG Chairman:** Peter Macumber [pmacumber@nightsky.org](mailto:pmacumber@nightsky.org)

**PSSG Co-Chair:** Open

**Sidewalk Astronomy:** Open  
[sidewalkastronomy@AtlantaAstronomy.org](mailto:sidewalkastronomy@AtlantaAstronomy.org)

**Light Tresspass:** Ken Edwards, Contact info TBA

**Woodruff Observ. Coordinator:** Sharon Carruthers  
[Treasurer@AtlantaAstronomy.org](mailto:Treasurer@AtlantaAstronomy.org)

**AAC Webmaster:** Daniel Herron

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

## AAC Events are listed in BOLD

- June 3rd, Saturday: Full Moon.
- June 10th, Saturday: Moon Last Quarter.
- June 13th, Tuesday: Venus next to Beehive (M44) evening.
- June 14th, Wednesday: Moon near Jupiter morning.
- June 17th, Saturday: **CEA Chapter Meeting 7:00PM.**
- June 18th, Sunday: New Moon.
- June 21st, Wednesday: Moon near Venus and Mars evening. Summer Solstice 10:57AM.
- June 26th, Monday: Moon First Quarter.
- July 3rd, Monday: Full Moon.
- July 9th, Sunday: Moon Last Quarter.
- July 10th, Monday: Mars less than 1 degree from Regulus evening.
- July 15th, Saturday: **CEA Chapter Meeting 7:00PM.**
- July 17th, Monday: New Moon.
- July 18th, Tuesday: Thin crescent moon evening.
- July 19th, Wednesday: Moon near Mercury and Venus evening.
- July 25th, Tuesday: Moon First Quarter.
- Aug 1st, Tuesday: Full Moon.
- Aug 8th, Tuesday: Moon Last Quarter.
- Aug 12th, Saturday: **CEA Chapter Member's Observing 8:30PM.** Perseids meteor shower peak.
- Aug 13th, Sunday: Venus at Inferior Conjunction.
- Aug 16th, Wednesday: New Moon.
- Aug 19th, Saturday: **CEA Chapter Meeting 6:30PM.**
- Aug 24th, Thursday: Moon First Quarter.

For more event listings and updates see the calendar at [www.atlantaastronomy.org](http://www.atlantaastronomy.org)

## Atlanta Astronomy Club Listserv

Because of the shutdown of Yahoo Groups, the Atlanta Astronomy Club Mailing List has been moved to IO Groups. You can visit the group, start reading messages and posting them here: <https://groups.io/g/AtlantaAstronomyClub>.

## 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](mailto:focalpoint@atlantaastronomy.org). Please send images separate from articles, not embedded in them. Articles are preferred as plain text files with images separate but Word documents or PDFs are okay. **The deadline for July is Friday, June 30. Submissions received after the deadline will go in the following issue.**



FIRST CLASS



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

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

Newsletter of The Atlanta Astronomy Club, Inc.

*The Focal Point*

