The Focal Point

Vol. 33 No. 2

The Atlanta Astronomy Club
Established 1947
October 2020

Editor: Tom Faber

Table of Contents

October AAC Meeting Cancelled

There will be no October meeting of the Atlanta Astronomy Club due to the ongoing COVID-19 pandemic and the requirements to limit group gatherings to prevent further spread of the disease. While we are not able to hold our monthly meetings right now, please continue to follow AAC on its web page and Facebook page for updates until we are able to have our regular meetings again.

In the mean time, you are encouraged to attend the Charlie Elliott Astronomy Meetings when they are held. See the article to the right for details.

Fernbank Science Center's Planetarium At Home Programs

While we have been unable to have in-person AAC meetings at the Fernbank Science Center for a while now, our host, Fernbank Science Center's planetary geologist Scott Harris, has been having a series of virtual programs about astronomy and planetary sciences on Fernbank's Facebook page. Recent programs have been about the Pluto system and the findings of the New Horizons mission, and the upcoming launch of the James Webb Space Telescope. For more information about Scott's upcoming programs check out Fernbank's Facebook page here: https://www.facebook.com/fernbankcenter

Charlie Elliott Chapter Meetings

The next Charlie Elliott Astronomy Meeting & Observing will be on Saturday, November 14, 2020 starting at 3:30PM. Check here for meeting updates: http://ceastronomy.org/blog/home

We had our October meeting last Saturday night with a small group (of about 12) and it was great to see some of our members. It had been a while. Thank you again David Whalen for another great presentation. (Overcast skies pretty much ended hopes of heading to the Jon Wood Astronomy field).

Observing nights for the remainder of 2020 will be held on 11/14, and 12/12, weather permitting. The status of in-person meetings will be announced monthly as the COVID situation changes. Visit the "Our Calendar" tab at the top of the page for our 2020-2021 meeting, observing, and outreach schedule. Start times vary throughout the year so please check back for details.

As we stated previously, we hope that you use these socially distancing times to observe on your own or even learn some new astro-oriented skills that you can talk about at our next official meeting. Whether you venture out to the Jon Wood Astronomy Field or a location closer to home, we suggest that you work on the Astronomical League's Lunar Observing Program (also called "Lunar I"), the Urban Observing Program and/or the Constellation Hunter Observing Program. These are all relatively easy and can be done from various locations in the metro Atlanta area. Go to:

https://www.astroleague.org/al/obsclubs/lunar/lunar1.html for information about the Lunar Observing Club.

https://www.astroleague.org/al/obsclubs/urban/urban.html for information on the Urban Observing Program.

https://www.astroleague.org/al/obsclubs/consthunt/const.html for information about the Constellation Hunter Observing Program; send e-mail requests for the Constellation Hunter Observing Program constellation maps and observing sketch form to poshedly@bellsouth.net

Please check out our Facebook Page! There you'll find a welcoming group of people sharing ideas and tips as well as organizing ad-hoc observing and imaging sessions on the Jon Wood Astronomy Field. For those not familiar with the Charlie Elliott Wildlife Center, go to https://georgiawildlife.com/CharlieElliott. The CEWC phone is 770-784-3059, Monday–Saturday 9 a.m.– 4:30 p.m.

The Night Sky Network (NSN)

As a member of the Atlanta Astronomy Club, you have a free membership in NASA's Night Sky Network (NSN). The Night Sky Network was started in 2004 and is a nationwide coalition of more than 400 amateur astronomy clubs that was developed and is operated for NASA by the Astronomical Society of the Pacific.

It functions to educate the public about NASA missions through local astronomy clubs by providing the clubs with information and outreach materials about NASA activities. Only members of registered astronomy clubs can become members of the NSN.

On a more practical level, the NSN provides the AAC with a website on which the AAC can maintain a club roster of members, maintain a calendar of events and send out e-mails to our members about Club activities. (In these days of anti-spam filters on most e-mail programs, this has been an invaluable resource for keeping members informed.)

When you are enrolled on the NSN you receive an e-mail from them on behalf of the AAC, with your User ID and your password. You can then go in and edit your membership information. If, for example, you do not wish to receive e-mails about upcoming events, you can check the box requesting no e-mails; or you can delete your e-mail address if you do not want ANY e-mails sent to you from the NSN.

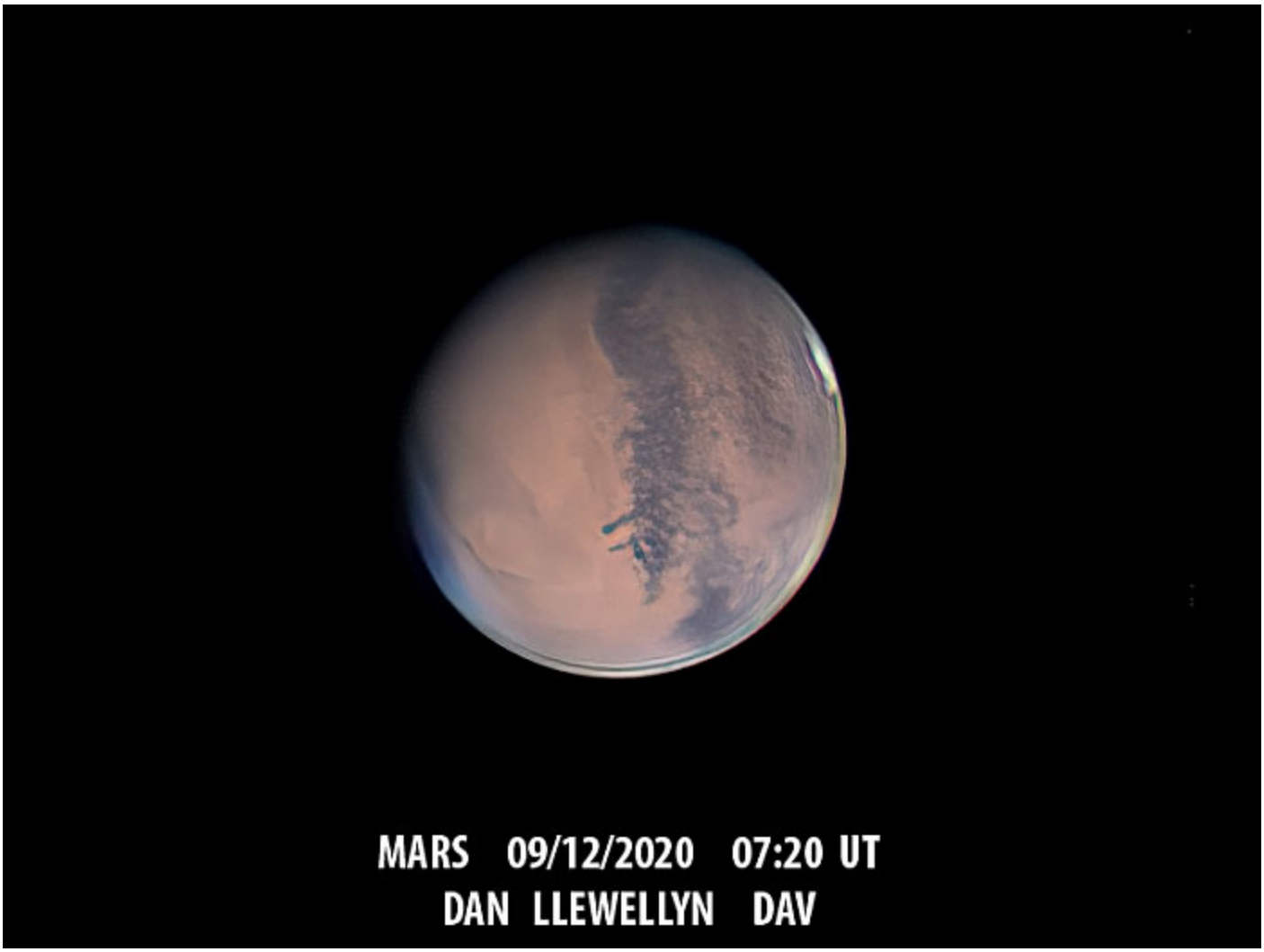
If you do this, or make other changes (such as updating your contact information), PLEASE either forward a note to me at Treasurer@AtlantaAstronomy.org, or make a note in the "Notes on Membership" box, as I may think the change was an oversight when you were registered and not a deliberate choice on your part and I would re-enter the information.

Daniel Herron and Sharon Carruthers are the AAC's NSN coordinators. If you have a problem or question, contact us for help.

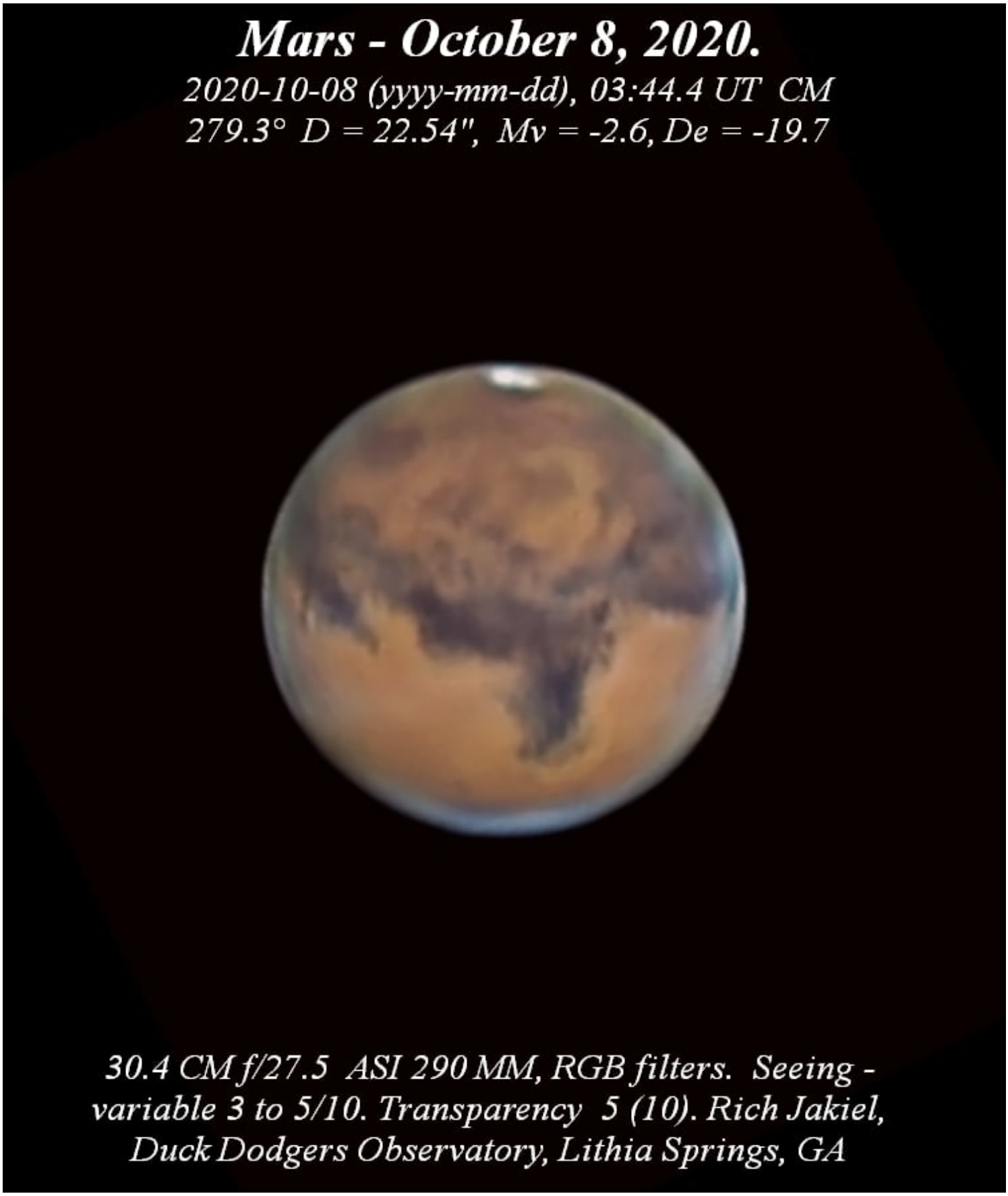
Sharon Carruthers, Treasurer@AtlantaAstronomy.org

Mars by Dan Llewellyn

I was doing darks after spending an hour doing deep sky after the clouds broke then came back. Well, the clouds broke again, and I went to Mars quickly to check the seeing. It was surprisingly good, and only lasted for 20 minutes or so. A clear example of being in the right place at the right time. Here is Mars through the C14 and a 1.8x barlow. Now hopefully this will motivate me to finish the other 2 months of planetary imaging of Jupiter and Mars that are in varying states of processing...



Mars by Richard Jakiel



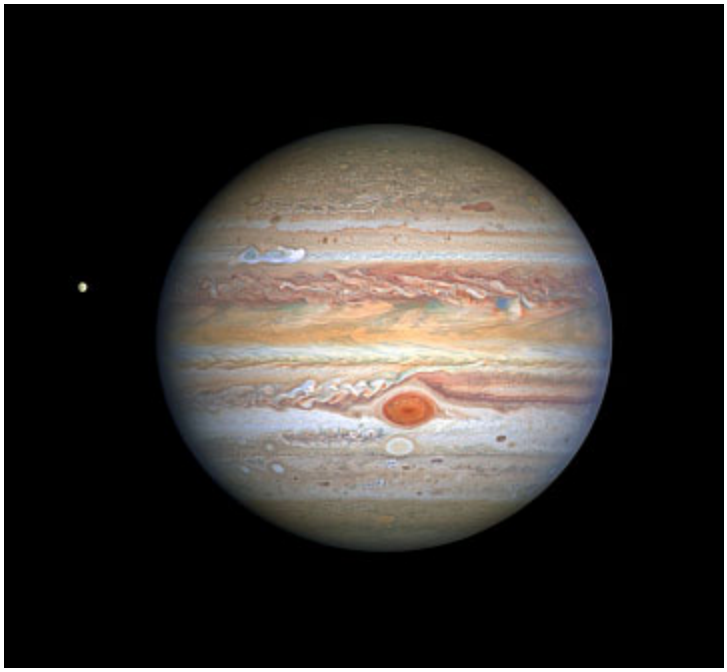
Hubble Captures Crisp New Portrait of Jupiter's Storms

NASA/STScI News Release - September 15, 2020

This latest image of Jupiter, taken by NASA's Hubble Space Telescope on August 25, 2020, was captured when the planet was 406 million miles from Earth. Hubble's sharp view is giving researchers an updated weather report on the monster planet's turbulent atmosphere, including a remarkable new storm brewing, and a cousin of the famous Great Red Spot region gearing up to change color – again.

A unique and exciting detail of Hubble's snapshot appears at mid-northern latitudes as a bright white stretched-out storm traveling around the planet at 350 miles per hour (560 kilometers per hour). This single plume erupted on August 18, 2020—and ground-based observers have discovered two more that appeared later at the same latitude.

While it's common for storms to pop up in this region every six years or so, often with multiple storms at once, the timing of the Hubble observations is perfect for showing the structure in the wake of the disturbance, during the early stages of its evolution. Trailing behind the plume are small, rounded features with complex "red, white, and blue" colors in Hubble's ultraviolet/visible/near-infrared-light image. Such discrete features typically dissipate on Jupiter, leaving behind only changes in cloud colors and wind speeds, but a similar storm on Saturn led to a long-lasting vortex. The differences in the aftermaths of Jupiter and Saturn storms may be related to the contrasting water abundances in their atmospheres, since water vapor may govern the massive amount of stored-up energy that can be released by these storm eruptions.



This image is a composite of separate exposures acquired by the WFC3 instrument on the Hubble Space Telescope. Several filters were used to sample narrow wavelength ranges. The color results from assigning different hues (colors) to each monochromatic (grayscale) image associated with an individual filter. In this case, the assigned colors are: Blue: F395N Green: F502N Red: F631N. NASA, ESA, STScI, A. Simon (Goddard Space Flight Center), and M.H. Wong (University of California, Berkeley) and the OPAL team.

Hubble shows that the Great Red Spot, rolling counterclockwise in the planet's southern hemisphere, is plowing into the clouds ahead of it, forming a cascade of white and beige ribbons. The Great Red Spot is currently an exceptionally rich red color, with its core and outermost band appearing deeper red.

Researchers say the Great Red Spot now measures about 9,800 miles across, big enough to swallow Earth. The super-storm is still shrinking as noted in telescopic observations dating back to 1930, but the reason for its dwindling size is a complete mystery.

Another feature researchers are noticing has changed is Oval BA, nicknamed by astronomers as Red Spot Jr., which appears just below the Great Red Spot in this image. For the past few years, Red Spot Jr. has been fading in color to its original shade of white after appearing red in 2006. However, now the core of this storm appears to be darkening slightly. This could hint that Red Spot Jr. is on its way to turning to a color more similar to its cousin once again.

Hubble's image shows that Jupiter is clearing out its higher altitude white clouds, especially along the planet's equator, where an orangish hydrocarbon smog wraps around it.

The icy moon Europa, thought to hold potential ingredients for life, is visible to the left of the gas giant.

This Hubble image is part of yearly maps of the entire planet taken as part of the Outer Planets Atmospheres Legacy program, or OPAL. The program provides annual Hubble global views of the outer planets to look for changes in their storms, winds, and clouds.

The Hubble Space Telescope is a project of international cooperation between NASA and ESA (European Space Agency). NASA's Goddard Space Flight Center in Greenbelt, Maryland, manages the telescope. The Space Telescope Science Institute (STScI) in Baltimore, Maryland, conducts Hubble science operations. STScI is operated for NASA by the Association of Universities for Research in Astronomy in Washington, D.C.

Credits: NASA, ESA, A. Simon (NASA/GSFC), M.H. Wong (University of California, Berkeley) and the OPAL team

Hubble Maps a Giant Halo Around the Andromeda Galaxy

NASA/STScI News Release - August 27, 2020

In a landmark study, scientists using NASA's Hubble Space Telescope have mapped the immense envelope of gas, called a halo, surrounding the Andromeda galaxy, our nearest large galactic neighbor. Scientists were surprised to find that this tenuous, nearly invisible halo of diffuse plasma extends 1.3 million light-years from the galaxy—about halfway to our Milky Way—and as far as 2 million light-years in some directions. This means that Andromeda's halo is already bumping into the halo of our own galaxy.

They also found that the halo has a layered structure, with two main nested and distinct shells of gas. This is the most comprehensive study of a halo surrounding a galaxy.

"Understanding the huge halos of gas surrounding galaxies is immensely important," explained co-investigator Samantha Berek of Yale University in New Haven, Connecticut. "This reservoir of gas contains fuel for future star formation within the galaxy, as well as outflows from events such as supernovae. It's full of clues regarding the past and future evolution of the galaxy, and we're finally able to study it in great detail in our closest galactic neighbor."

"We find the inner shell that extends to about a half million light-years is far more complex and dynamic," explained study leader Nicolas Lehner of

the University of Notre Dame in Indiana. “The outer shell is smoother and hotter. This difference is a likely result from the impact of supernova activity in the galaxy’s disk more directly affecting the inner halo.”

A signature of this activity is the team’s discovery of a large amount of heavy elements in the gaseous halo of Andromeda. Heavier elements are cooked up in the interiors of stars and then ejected into space—sometimes violently as a star dies. The halo is then contaminated with this material from stellar explosions.

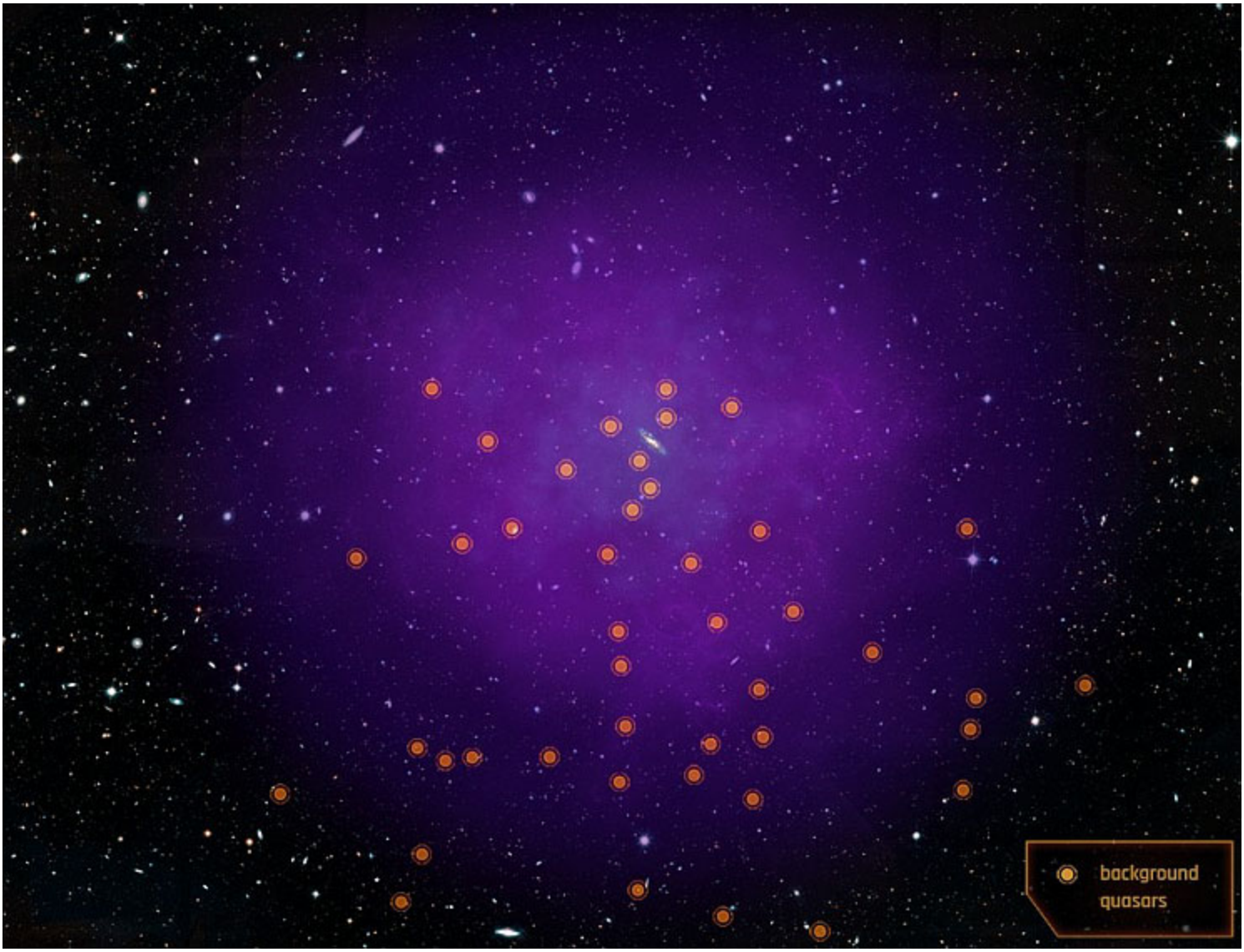
The Andromeda galaxy, also known as M31, is a majestic spiral of perhaps as many as 1 trillion stars and comparable in size to our Milky Way. At a distance of 2.5 million light-years, it is so close to us that the galaxy appears as a cigar-shaped smudge of light high in the autumn sky. If its gaseous halo could be viewed with the naked eye, it would be about three times the width of the Big Dipper. This would easily be the biggest feature on the nighttime sky.

Through a program called Project AMIGA (Absorption Map of Ionized Gas in Andromeda), the study examined the light from 43 quasars—the very distant, brilliant cores of active galaxies powered by black holes—located far beyond Andromeda. The quasars are scattered behind the halo, allowing scientists to probe multiple regions. Looking through the halo at the quasars’ light, the team observed how this light is absorbed by the Andromeda halo and how that absorption changes in different regions. The immense Andromeda halo is made of very rarified and ionized gas that doesn’t emit radiation that is easily detectable. Therefore, tracing the absorption of light coming from a background source is a better way to probe this material.

The researchers used the unique capability of Hubble’s Cosmic Origins Spectrograph (COS) to study the ultraviolet light from the quasars. Ultraviolet light is absorbed by Earth’s atmosphere, which makes it impossible to observe with ground-based telescopes. The team used COS to detect ionized gas from carbon, silicon and oxygen. An atom becomes ionized when radiation strips one or more electrons from it.

Andromeda’s halo has been probed before by Lehner’s team. In 2015, they discovered that the Andromeda halo is large and massive. But there was little hint of its complexity; now, it’s mapped out in more detail, leading to its size and mass being far more accurately determined.

Continued on page 7



This illustration shows the location of the 43 quasars scientists used to probe Andromeda’s gaseous halo. These quasars—the very distant, brilliant cores of active galaxies powered by black holes—are scattered far behind the halo, allowing scientists to probe multiple regions. Looking through the immense halo at the quasars’ light, the team observed how this light is absorbed by the halo and how that absorption changes in different regions. By tracing the absorption of light coming from the background quasars, scientists are able to probe the halo’s material. Credits: NASA, ESA, and E. Wheatley (STScI)

Hubble Watches Exploding Star Fade into Oblivion

NASA/STScI News Release - October 01, 2020

When a star unleashes as much energy in a matter of days as our Sun does in several billion years, you know it's not going to remain visible for long.

Like intergalactic paparazzi, NASA's Hubble Space Telescope captured the quick, fading celebrity status of a supernova, the self-detonation of a star. The Hubble snapshots have been assembled into a telling movie of the titanic stellar blast disappearing into oblivion in the spiral galaxy NGC 2525, located 70 million light-years away.

Hubble began observing SN 2018gv in February 2018, after the supernova was first detected by amateur astronomer Koichi Itagaki a few weeks earlier in mid-January. Hubble astronomers were using the supernova as part of a program to precisely measure the expansion rate of the universe—a key value in understanding the physical underpinnings of the cosmos. The supernova serves as a milepost maker to measure galaxy distances, a fundamental value needed for measuring the expansion of space.

In the time-lapse sequence, spanning nearly a year, the supernova first appears as a blazing star located on the galaxy's outer edge. It initially outshines the brightest stars in the galaxy before fading out of sight.

"No Earthly fireworks display can compete with this supernova, captured in its fading glory by the Hubble Space Telescope," said Nobel Laureate Adam Riess of the Space Telescope Science Institute (STScI) and Johns Hopkins University, in Baltimore, Maryland, leader of the High-z Supernova Search Team and the Supernovae H0 for the Equation of State (SH0ES) Team to measure the universe's expansion rate.

The type of supernova seen in this sequence originated from a burned-out star—a white dwarf located in a close binary system—that is accreting material from its companion star. When the white dwarf reaches a critical mass, its core becomes hot enough to ignite nuclear fusion, turning it into a giant atomic bomb. This thermonuclear runaway process tears the dwarf apart. The opulence is short-lived as the fireball fades away.

Because supernovae of this type all peak at the same brightness, they are known as "standard candles," which act as cosmic tape measures. Knowing the actual brightness of the supernova and observing its brightness in the sky, astronomers can calculate the distances of their host galaxies. This allows astronomers to measure the expansion rate of the universe. Over the past 30 years Hubble has helped dramatically improve the precision of the universe's expansion rate.

Image Caption

Astronomers using NASA's Hubble Space Telescope captured the quick, fading celebrity status of a supernova, the self-detonation of a star. The Hubble snapshots have been assembled into a telling movie of the titanic stellar blast disappearing into oblivion in the spiral galaxy NGC 2525, located 70 million light-years away.

Hubble began observing SN 2018gv in February 2018, after the supernova was first detected by amateur astronomer Koichi Itagaki a few weeks earlier in mid-January. Hubble astronomers were using the supernova as part of a program to precisely measure the expansion rate of the universe—a key value in understanding the physical underpinnings of the cosmos. The supernova serves as a milepost maker to measure galaxy distances, a fundamental value needed for measuring the expansion of space.

The supernova appears as a blazing star located on the galaxy's outer edge in the lower left portion of the frame. It initially outshines the brightest stars in the galaxy before fading out of sight. The time-lapse video consists of observations taken from February 2018 to February 2019.

Credits: NASA, ESA, and A. Riess (STScI/JHU) and the SH0ES team. Acknowledgment: M. Zamani (ESA/Hubble)

Continued from page 5

"Previously, there was very little information—only six quasars—within 1 million light-years of the galaxy. This new program provides much more information on this inner region of Andromeda's halo," explained co-investigator J. Christopher Howk, also of Notre Dame. "Probing gas within this radius is important, as it represents something of a gravitational sphere of influence for Andromeda."

Because we live inside the Milky Way, scientists cannot easily interpret the signature of our own galaxy's halo. However, they believe the halos of Andromeda and the Milky Way must be very similar since these two galaxies are quite similar. The two galaxies are on a collision course, and will merge to form a giant elliptical galaxy beginning about 4 billion years from now.

Scientists have studied gaseous halos of more distant galaxies, but those galaxies are much smaller on the sky, meaning the number of bright enough background quasars to probe their halo is usually only one per galaxy. Spatial information is therefore essentially lost. With its close proximity to Earth, the gaseous halo of Andromeda looms large on the sky, allowing for a far more extensive sampling.

"This is truly a unique experiment because only with Andromeda do we have information on its halo along not only one or two sightlines, but over 40," explained Lehner. "This is groundbreaking for capturing the complexity of a galaxy halo beyond our own Milky Way."

In fact, Andromeda is the only galaxy in the universe for which this experiment can be done now, and only with Hubble. Only with an ultraviolet-sensitive future space telescope will scientists be able to routinely undertake this type of experiment beyond the approximately 30 galaxies comprising the Local Group.

"So Project AMIGA has also given us a glimpse of the future," said Lehner.

The team's findings appear in the August 27 edition of The Astrophysical Journal.

The Hubble Space Telescope is a project of international cooperation between NASA and ESA (European Space Agency). NASA's Goddard Space Flight Center in Greenbelt, Maryland, manages the telescope. The Space Telescope Science Institute (STScI) in Baltimore, Maryland, conducts Hubble science operations. STScI is operated for NASA by the Association of Universities for Research in Astronomy, in Washington, D.C. Credits: NASA, ESA, and N. Lehner (University of Notre Dame)

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. 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/atlastro.

AAC Officers and Contacts

President: Dave Lumpkin President@AtlantaAstronomy.org

Program Chair: Open 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: Lilli Lindbeck, Secretary@AtlantaAstronomy.org

Board Chair: Sharon Carruthers Treasurer@AtlantaAstronomy.org

Board: Brigitte Fessele, bhfessele1@gmail.com

Board: Open

Board: Steve Phillips sandsphillips@att.net

ALCor: Ken Olson, keneolson@yahoo.com

Elliott Chapter Director: Mike Shaw director@ceastronomy.org

Elliott Observing Supervisor: Steve Siedentop observing@ceastronomy.org

Elliott Recording Secretary: Daniel de la Reza secretary@ceastronomy.org

Elliott Program Coordinator: Steve Siedentop program@ceastronomy.org

Elliott Outreach Coordinator: Marie Lott outreach@ceastronomy.org

Elliott Astrophotography Coordinator: Mike Mardis

Elliott Chapter AL Liaison: David Whalen

Elliott Facilities Coordinator: Matt Harvey facilities@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: Open sidewalkastronomy@AtlantaAstronomy.org

Light Tresspass: Ken Edwards, Contact info TBA

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

AAC Webmaster: Daniel Herron

Observing@AtlantaAstronomy.org

ATLANTA ASTRONOMY CLUB EST. 1947

The Focal Point

Newsletter of The Atlanta Astronomy Club, Inc.

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

Atlanta Astronomy Club
P.O. Box 76155
Atlanta, GA 30358-1155
www.atlantaastronomy.org
On Twitter at http://twitter.com/atlastro

www.beetagg.com

FIRST CLASS

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

AAC Events are listed in BOLD

Oct 9th, Friday: Moon Last Quarter.
Oct 13th, Tuesday: Moon above Venus morning. Mars at opposition.
Oct 14th, Wednesday: Moon below Venus morning.
Oct 16th, Friday: New Moon.
Oct 17th, Saturday: **Tentative - CEA observing at the Jon Wood Astronomy Field.**
Oct 22nd, Thursday: Orionids meteor shower peaks. Moon near Jupiter & Saturn.
Oct 23rd, Friday: Moon First Quarter.
Oct 29th, Thursday: Moon near Mars.
Oct 31st, Saturday: Full Moon. Uranus at opposition.
Nov 8th, Sunday: Moon Last Quarter.
Nov 11th, Wednesday: Mercury, Venus, and Spica form a near right triangle morning.
Nov 13th, Friday: Moon between Venus and Mercury morning.
Nov 15th, Sunday: New Moon.
Nov 18th, Wednesday: Leonids meteor shower peaks. Moon near Jupiter & Saturn evening.
Nov 21st, Saturday: Moon First Quarter.
Nov 25th, Wednesday: Moon near Mars evening.
Nov 30th, Monday: Full Moon. Penumbral lunar eclipse - Maximum at 4:43AM.
Dec 7th, Monday: Moon Last Quarter.
Dec 8th, Tuesday: Earliest Sunset in Atlanta: ~5:27PM EST.
Dec 14th, Monday: New Moon. Geminids meteor shower peaks.
Dec 21st, Monday: Moon First Quarter. Great Junction of Jupiter and Saturn.
Dec 21st, Monday: Ursids meteor shower peaks. Winter Solstice at 5:03AM.
Dec 29th, Tuesday: Full Moon.

For more event listings and updates 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 with images separate but Word documents or PDFs are okay. **The deadline for November is Friday, October 30. Submissions received after the deadline will go in the following issue**.