



ASTROFILES

Auburn Astronomical Society Newsletter

February 2020

Newsletter Editor — John Wingard — jwin1048@gmail.com

Moon Phases

February 15 — Last Quarter
February 23 — New Moon
March 2 — First Quarter
March 9 — Full Moon
March 16 — Last Quarter
March 24 — New Moon
April 1 — First Quarter
April 7 — Full Moon

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[https://www.facebook.com/
groups/79864233515/](https://www.facebook.com/groups/79864233515/)

Next Club Meeting and Events

The next meeting of the Auburn Astronomical Society will be combined with an upcoming event. This year National Astronomy Day will be celebrated on Saturday, May 2, 2020. Astronomy Day is sponsored by the Astronomical League, the national organization representing member astronomy clubs throughout the country. As in past years, we have been invited to come to the W.A. Gayle Planetarium in Montgomery that day to assist in their Astronomy Day event. This will be in lieu of our normal meeting on the AU campus. All AAS members are encouraged to come to the Planetarium and bring their telescopes that will be set up outside that evening for viewing by the public. Members are encouraged to arrive by mid-afternoon to be available to answer questions from the planetarium visitors prior to the evening viewing activities. If you don't have a telescope you are encouraged to come anyway. This is a rain-or-shine event. In the event of cloudy or rainy weather, we sometimes set up some scopes in the planetarium lobby and answer questions from the public in that setting. Additional details will be provided in later newsletters.

It's not too late to renew your 2020 AAS dues

Quite a few have already renewed their AAS dues for 2020 but if you haven't, it's not too late. Thank you to those that have already renewed! Renewal dues are \$20.00 and can be sent to the address listed on the member application at the end of this newsletter. If you would like to join as a new member, dues are prorated based on the month of joining. This information is also listed on the member application.

Star gaze at Kiesel Park a success!

Members of the AAS assisted with a star gaze at Kiesel Park in Auburn on the evening of February 1, 2020. This event was sponsored by the Kreher Preserve & Nature Center in Auburn. All during that day, the weather forecast did not appear to be suitable for any celestial viewing, but about the time the event was scheduled to begin the skies cleared! There were several AAS members in attendance with their scopes, along with a nice turnout of public visitors in spite of the iffy weather. Thanks to all of the AAS members that came and helped to support this event. Hopefully it may have sparked an interest in astronomy with some of the visitors.

Viewing opportunities at the Heaven Hill observing site

AAS member Mike Lewis has arranged a series of observing dates at the Heaven Hill site located near Alexander City, AL. This site is on the Russell Lands property. Mike has chosen Saturday dates that are closest to new moon dates. Each date has been approved with the understanding that the site may be required for other events from time to time. In that case they will let us know ahead of time. Before going, all AAS members should register with Russell Lands to receive their trail permit. Here are the 2020 dates:

Saturday, March 21

Saturday, April 25

Saturday, May 23

Saturday, June 20

Saturday, July 18

Saturday, August 22

Saturday, September 19

Saturday, October 17

Saturday, November 14

Saturday, December 12

Astrophotography Images

If you missed the last AAS club meeting on February 7, 2020, you missed a treat. AAS member Jay Hall had a selection beautiful color prints of some of his most recent astrophotography images. If you follow our Facebook page you can see some of these incredible images along with those by AAS member Chris Young.



New astronomy club formed by Auburn University students

We were recently contacted by one of the co-founders of a new student-lead astronomy club on the Auburn University campus. They are sponsored by the Auburn University Department of Physics and have already had an initial meeting consisting of approximately 50 members. They have reached out to us with the hope that our two groups can find ways to cooperate on various events and projects. Our group has a lot of practical observing experience and their group has access to faculty members with academic and research experience. We have made an initial response to their request and will provide more information as it becomes available.





This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

Betelgeuse and the Crab Nebula: Stellar Death and Rebirth

David Prosper

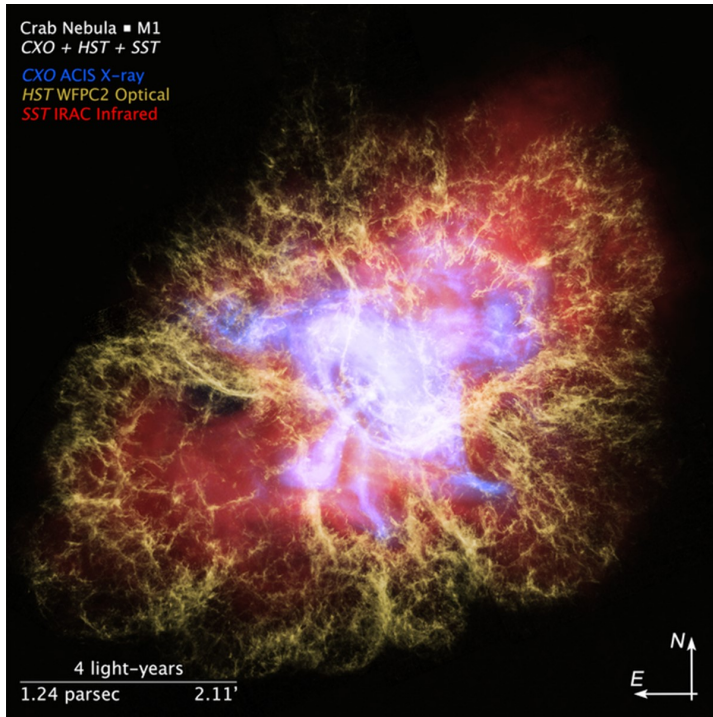
What happens when a star dies? Stargazers are paying close attention to the red giant star **Betelgeuse** since it recently dimmed in brightness, causing speculation that it may soon end in a brilliant supernova. While it likely won't explode quite yet, we can preview its fate by observing the nearby **Crab Nebula**.

Betelgeuse, despite its recent dimming, is still easy to find as the red-hued shoulder star of Orion. A known variable star, Betelgeuse usually competes for the position of the brightest star in Orion with brilliant blue-white Rigel, but recently its brightness has faded to below that of nearby Aldebaran, in Taurus. Betelgeuse is a young star, estimated to be a few million years old, but due to its giant size it leads a fast and furious life. This massive star, known as a supergiant, exhausted the hydrogen fuel in its core and began to fuse helium instead, which caused the outer layers of the star to cool and swell dramatically in size. Betelgeuse is one of the only stars for which we have any kind of detailed surface observations due to its huge size – somewhere between the diameter of the orbits of Mars and Jupiter - and relatively close distance of about 642 light-years. Betelgeuse is also a “runaway star,” with its remarkable speed possibly triggered by merging with a smaller companion star. If that is the case, Betelgeuse may actually have millions of years left! So, Betelgeuse may not explode soon after all; or it might explode tomorrow! We have much more to learn about this intriguing star.

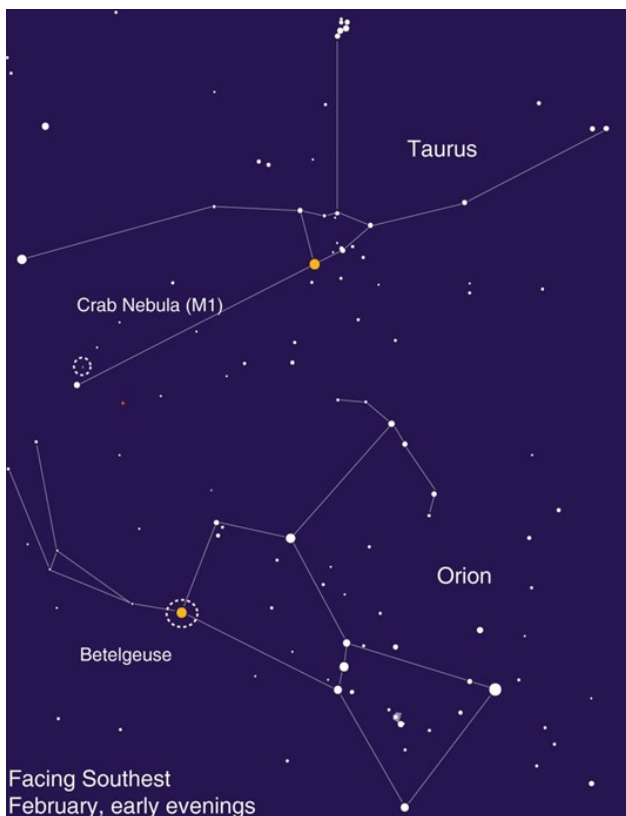
The **Crab Nebula** (M1) is relatively close to Betelgeuse in the sky, in the nearby constellation of Taurus. Its ghostly, spidery gas clouds result from a massive explosion; a supernova observed by astronomers in 1054! A backyard telescope allows you to see some details, but only advanced telescopes reveal the rapidly spinning neutron star found in its center: the last stellar remnant from that cataclysmic event. These gas clouds were created during the giant star's violent demise and expand ever outward to enrich the universe with heavy elements like silicon, iron, and nickel. These element-rich clouds are like a cosmic fertilizer, making rocky planets like our own Earth possible. Supernova also send out powerful shock waves that help trigger star formation. In fact, if it wasn't for a long-ago supernova, our solar system - along with all of us - wouldn't exist! You can learn much more about the Crab Nebula and its neutron star in a new video from NASA's Universe of Learning, created from observations by the Great Observatories of Hubble, Chandra, and Spitzer: bit.ly/CrabNebulaVisual

Our last three articles covered the life cycle of stars from observing two neighboring constellations: Orion and Taurus! Our stargazing took us to the “baby stars” found in the stellar nursery of the Orion Nebula, onwards to the teenage stars of the Pleiades and young adult stars of the Hyades, and ended with dying Betelgeuse and the stellar corpse of the Crab Nebula. Want to know more about the life cycle of stars? Explore stellar evolution with “The Lives of Stars” activity and handout: bit.ly/starlifeanddeath .

Check out NASA's most up to date observations of supernova and their remains at nasa.gov



This image of the Crab Nebula combines X-ray observations from Chandra, optical observations from Hubble, and infrared observations from Spitzer to reveal intricate detail. Notice how the violent energy radiates out from the rapidly spinning neutron star in the center of the nebula (also known as a pulsar) and heats up the surrounding gas. More about this incredible “pulsar wind nebula” can be found at bit.ly/Crab3D. Credit: NASA, ESA, F. Summers, J. Olmsted, L. Hustak, J. DePasquale and G. Bacon (STScI), N. Wolk (CfA), and R. Hurt (Caltech/IPAC)

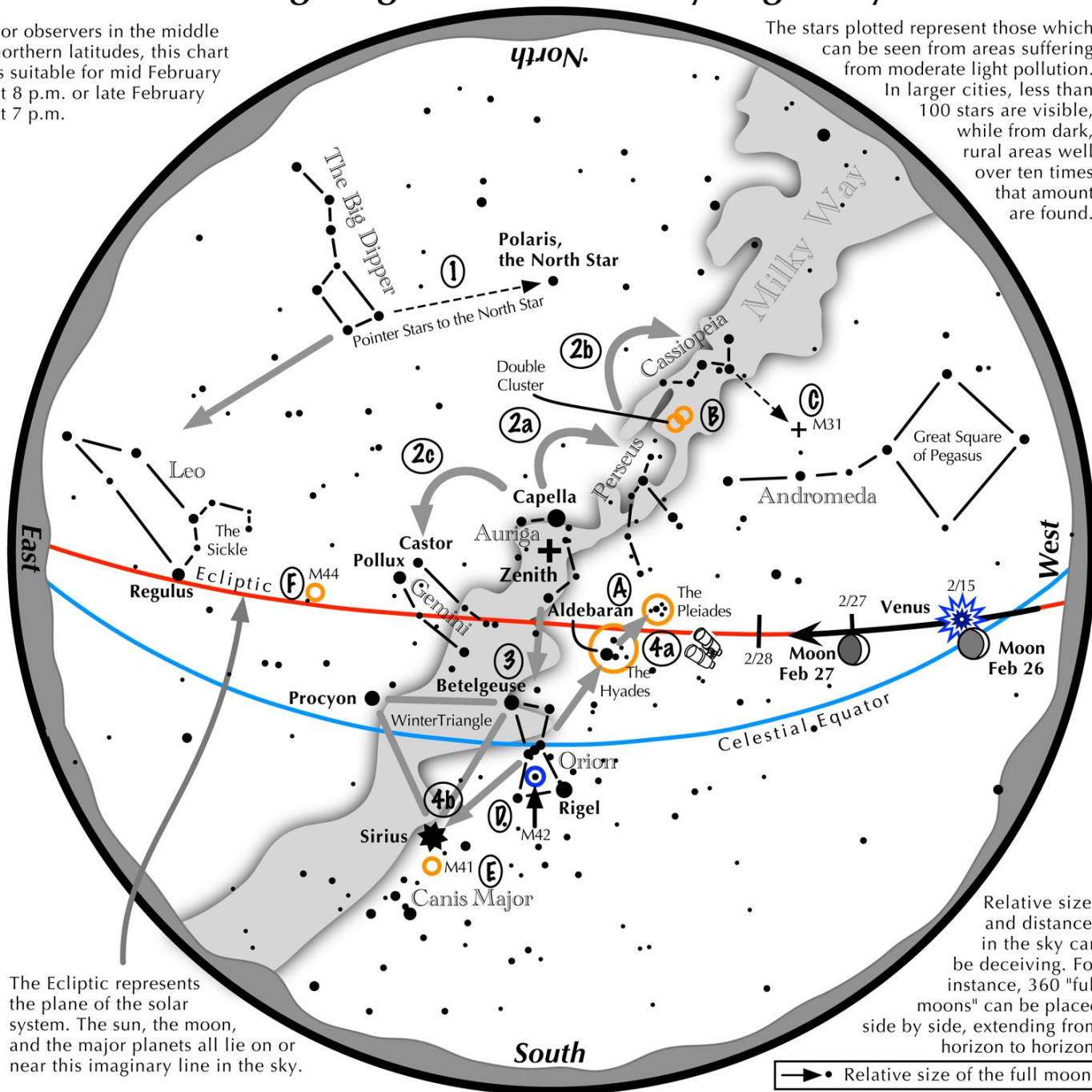


Spot Betelgeuse and the Crab Nebula after sunset! A telescope is needed to spot the ghostly Crab.

Navigating the mid February Night Sky

For observers in the middle northern latitudes, this chart is suitable for mid February at 8 p.m. or late February at 7 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

→ • Relative size of the full moon.

Navigating the February night sky: Simply start with what you know or with what you can easily find.

- 1 Above the northeast horizon rises the Big Dipper. Draw a line from its two end bowl stars upwards to the North Star.
- 2 Face south. Overhead twinkles the bright star Capella in Auriga. Jump northwestward along the Milky Way first to Perseus, then to the "W" of Cassiopeia. Next jump southeastward from Capella to the twin stars of Castor and Pollux in Gemini.
- 3 Directly south of Capella stands the constellation of Orion with its three Belt stars, its bright red star Betelgeuse, and its bright blue-white star Rigel.
- 4 Use Orion's three Belt stars to point northwest to the red star Aldebaran and the Hyades star cluster, then to the Pleiades star cluster. Travel southeast from the Belt stars to the brightest star in the night sky, Sirius, a member of the Winter Triangle.

Binocular Highlights

- A: Examine the stars of two naked eye star clusters, the Pleiades and the Hyades.
- B: Between the "W" of Cassiopeia and Perseus lies the Double Cluster.
- C: The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval.
- D: M42 in Orion is a star forming nebula. E: Look south of Sirius for the star cluster M41. F: M44, a star cluster barely visible to the naked eye, lies southeast of Pollux.



Astronomical League www.astroleague.org/outreach; duplication is allowed and encouraged for all free distribution.



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Dim Delights in Cancer

David Prosper

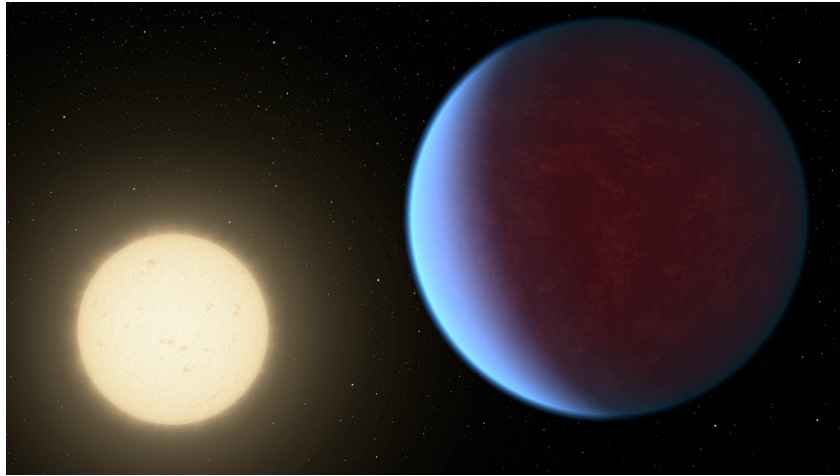
Cancer the Crab is a dim constellation, yet it contains one of the most beautiful and easy-to-spot star clusters in our sky: the **Beehive Cluster**. Cancer also possesses one of the most studied exoplanets: the superhot super-Earth, **55 Cancri e**.

Find **Cancer's** dim stars by looking in between the brighter neighboring constellations of Gemini and Leo. Don't get frustrated if you can't find it at first, since Cancer isn't easily visible from moderately light polluted areas. Once you find Cancer, look for its most famous deep-sky object: the **Beehive Cluster**! It's a large open cluster of young stars, three times larger than our Moon in the sky. The Beehive is visible to unaided eyes under good sky conditions as a faint cloudy patch, but is stunning when viewed through binoculars or a wide-field telescope. It was one of the earliest deep-sky objects noticed by ancient astronomers, and so the Beehive has many other names, including Praesepe, Nubilum, M44, the Ghost, and Jishi qi. Take a look at it on a clear night through binoculars. Do these stars look like a hive of buzzing bees? Or do you see something else? There's no wrong answer, since this large star cluster has intrigued imaginative observers for thousands of years.

55 Cancri is a nearby binary star system, about 41 light years from us and faintly visible under excellent dark sky conditions. The larger star is orbited by at least five planets including **55 Cancri e**, (a.k.a. Janssen, named after one of the first telescope makers). Janssen is a "super-earth," a large rocky world 8 times the mass of our Earth, and orbits its star every 18 hours, giving it one of the shortest years of all known planets! Janssen was the first exoplanet to have its atmosphere successfully analyzed. Both the Hubble and recently-retired Spitzer space telescopes confirmed that the hot world is enveloped by an atmosphere of helium and hydrogen with traces of hydrogen cyanide: not a likely place to find life, especially since the surface is probably scorching hot rock. The NASA Exoplanet Catalog has more details about this and many other exoplanets at bit.ly/nasa55cancric.

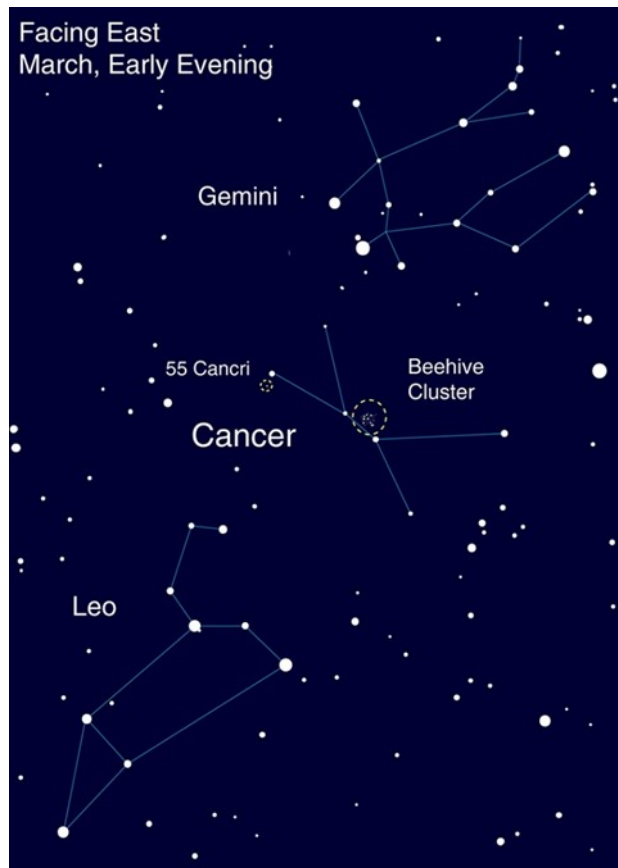
How do astronomers find planets around other star systems? The Night Sky Network's "How We Find Planets" activity helps demonstrate both the transit and wobble methods of exoplanet detection: bit.ly/findplanets. Notably, 55 Cancri e was discovered via the wobble method in 2004, and then the transit method confirmed the planet's orbital period in 2011!

Want to learn more about exoplanets? Get the latest NASA news about worlds beyond our solar system at nasa.gov.



Artist concept of 55 Cancri e orbiting its nearby host star. Find details from the Spitzer Space Telescope's close study of its atmosphere at: bit.ly/spitzer55cancrie and the Hubble Space Telescope's observations at bit.ly/hubble55cancrie

Credit: NASA/JPL-Caltech



Look for Cancer in between the "Sickle" or "Question Mark" of Leo and the bright twin stars of Gemini. You can't see the planets around 55 Cancri, but if skies are dark enough you can see the star itself. Can you see the Beehive Cluster?



Auburn Astronomical Society Membership Application Form

Name:

Address:

City: _____ State: _____ Zip: _____

Phone: _____ Date of Application* ____/____/____

E-mail:

Telescope(s):

Area(s) of special interest:

Enclose: \$20.00 for regular membership, payable in January. *Full-Time* student membership is half the Regular rate.

If you are a NEW member joining after the first of the year, refer to the prorated table below

Jan \$20.00	Feb \$18.33	Mar \$16.66	Apr \$14.99	May \$13.33	Jun \$11.66
Jul \$10.00	Aug \$8.33	Sep \$6.66	Oct \$4.99	Nov \$2.33	Dec \$1.66

Make checks payable to: Auburn Astronomical Society and return this application to:

Auburn Astronomical Society
c/o John Wingard, Secretary/Treasurer
#5 Wexton Court
Columbus, GA 31907

For questions about your dues or membership status, contact: jwin1048@gmail.com

Thank you for supporting the Auburn Astronomical Society!