



Peoria Astronomical Society, Inc.

P.O. Box 10111 Peoria, IL 61612-0111
Section of Peoria Academy of Science
Affiliate of the Astronomical League
www.astronomical.org

STARLITE

Summer, 2023

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LEDA 2046648 in Hercules from JWST

Officers:

President: Dan Son, sonshine1992@gmail.com

Vice-President: Brian Bill

Secretary: Phil Burroughs

Treasurer: Dave Monroe, dave.monroe@comcast.net

Directors:

Parliamentarian: Dave Monroe, dave.monroe@comcast.net

Nominating Chairman:

Legal Agent: Rodney Nordstrom

Northmoor Chairman: Dan Son, sonshine1992@gmail.com

Jubilee Chairman: Jesse Hoover

PEORIA ASTRONOMICAL SOCIETY IS NOW ON FACEBOOK:

www.facebook.com/PeoriaAstronomicalSociety

Update your address, phone or email changes

Please notify Dan Son at sonshine1992@gmail.com if you will be getting a new mailing address, email address and/or phone number. It is important that he has your personal information correct so you will continue to receive the Starlite and the Reflector.

NEW MEMBERS:

The Peoria Astronomical Society welcomes new members:

2023 Meteor Shower Schedule:

Perseid activity is from July 14th to September 1st but peak night is August 12-13 with a 10% full moon. Comet 109P/Swift-Tuttle is the source for this meteor shower.



Presidents Ramblings:

Well summer is upon us and I hope everyone is taking advantage of the weather. I hope you enjoyed the members programs that Sheldon Schafer had set up. We are very fortunate to have him as a program director. I am looking forward when our members meetings start up again in October.

Northmoor is up and running and we have some new helpers and keyholders. Jubilee mowing & maintenance is running and I thank all those who volunteer their time to helping up maintain our equipment and public observing parties, without volunteers we are nothing. We are always in need of more volunteers and if you want to help in any way, let me know and we can make it happen (309-224-9150).

My viewing has been short this year as I broke a wrist and it heals slower as we get older(doesn't help that my scope weighs 100 pounds). We have a few opportunities to observe and plan on getting back into it. **Havana airport is having a fly-in on Saturday June 17th**. We had a few members take scopes out onto the grassy area and show off the night sky. We can set up tents and sleep overnight in the airport and they will provide breakfast on Sunday morning. This is a very dark sky area and we will enjoy a new moon. Look for more information on our email group. The 3rd annual Kickapoo Creek Festival at Wildlife Prairie Park is on August 11,12 & 12. PAS will be helping by having a solar scope out during the day and any members are encouraged to bring scopes out for public viewing. More information will be forthcoming in our email group. We have other opportunities and I will send them over to the email group as they have more details than I can say here.

Well I have rambled on too long and must get back to work. Thanks for supporting PAS now and in the Future!!

Dan Son

A Primer for the Intermediate *Lesson Two: Observing Globular Clusters*

by John Barra

Lesson One appeared in Starlite Issue #133, March 1998

In 1924, Mary Proctor viewed a globular cluster through the 40-inch refractor at Yerkes Observatory. She wrote: "Myriads of glistening points shimmering over a soft background of starry mist, illumined as though by moonlight, formed a striking contrast to the darkness of the night sky. For a few blissful moments, during which the watcher gazed on this scene, it suggested a veritable glimpse of the heavens beyond...."

Her words describe globular clusters we've all seen before. But once we've done so, we think there isn't much more to view. They all seem the same, at least to the untrained eye. On the contrary: there is much more to look at; they aren't all the same. But first a little science.

THE SCIENCE OF GLOBULAR CLUSTERS

Globular clusters in our galaxy are almost as old as the galaxy. They were formed over 10 billion years ago — not long after the creation of our galaxy or the universe itself. They hold their shape because their stars are gravitationally attracted to each other.

The clusters in our galaxy hold from 100,000 to well over 1,000,000 stars. These clusters generally fall within a sphere around the galaxy's core. The farthest ones from us are about 60,000 light years away, making them about 30,000 light years from the center. Their diameters can reach 100 light years across.

Almost 130 globular clusters have been identified in our galaxy. One could reasonably assume that another 100 exist, hidden by the dust and other material at the galactic center. Of the 130 known, 29

are Messier objects. Since these clusters are relatively near the center, it isn't surprising that nearly 40% of the known ones, 49, are located in either Ophiucus, Sagittarius, or Scorpius.

What is known about globular clusters in our galaxy — particularly brightness, distance, and variable stars within them — can be applied to globular clusters viewed in nearby galaxies. Astronomers use this information as a stepping-stone in determining distances of galaxies and other objects farther out in our universe. But for most amateurs, their greatest characteristic is their beauty. Here are a few things amateur viewers can use to enhance a globular cluster's beauty and to show that they are not all the same.

DENSITY

Globular clusters vary greatly in the density of the stars within them. This factor and the visual magnitude determine how easily their individual stars are resolvable. Harlow Shapley devised a classification of these clusters using Roman Numerals I through XII. The clusters with the highest concentration of stars are classified as I while those with a very loose density with almost no central concentration are classified as XII.

M75 in Sagittarius has a I classification. It has a very rich central area. M2 in Aquarius and M80 in Scorpius are also very compact with a classification of II. It takes as much power as your telescope allows to resolve any stars near their centers.

On the other end, M55, a class XI in Sagittarius, and two class Xs, M107 in Ophiucus and M56 in Lyra, are very loose and easily resolvable.

M13, the great Hercules Cluster, has an average density with a V

classification. It is considered the best globular cluster to view at our latitude in the Northern Hemisphere. It has over a millions stars. Many are resolvable. The longer you look at it, the more stars you can see. It quickly takes on an almost 3-dimensional view.

BRIGHTNESS, SIZE, AND DISTANCE

How easy it is to resolve the stars in a globular cluster depends upon the cluster's visual magnitude. Since most to don't vary greatly in actual size, a cluster's brightness is proportional to its apparent size and actual distance from us. Essentially, the closer a globular cluster is to us, the larger its apparent size and the greater its visual magnitude (and vice versa). However, not every cluster follows this general rule.

The four farthest Messier globulars with related information are listed in Table 1.

These clusters are difficult if not impossible to resolve. When trying to resolve a globular cluster, use as high a power eyepiece as your telescope and seeing conditions will allow. If you still can't resolve it into at least some individual stars, don't feel bad. Not all clusters can be resolved with amateur scopes.

On the other hand, Table 2 lists the two closest Messier and the two brightest non-Messier globular clusters in the sky.

M4 near Antares is the easiest to resolve from our latitude. Anyone should be able to see huge numbers of individual stars. M22 would be the greatest such cluster for us to view from here were it not for the fact it is so low in the sky and it has all the foreground stars and dust to compete with near the Milky

(Continued on page 9)

"Myriads of glistening points...."

Primer...

(Continued from page 8)

Way's galactic center. Even then it is quite a sight.

The two most impressive globular clusters, Omega Centari and 47 Tucanae, are easily seen with the naked eye. Unfortunately, they can not be seen at our latitude, although Omega Centari can be seen in the southern states if you get a chance to be there during the spring. M13, M5, and M3 are considered to be the first, third and fourth best clusters to view in Central Illinois, even though they fall in the mid-range of distances from us. The more you stare at each of these, the more individual sparkling gems you can see. They differ from the general rule mentioned earlier because of their actual size and the fact they are high above the horizon.

OTHER THINGS TO VIEW

Areas or lanes of dust have been reported in some globular clusters. Look carefully and see if you can spot any. It usually takes high power and larger telescopes. I did note the often-described Y-

shaped dust lanes in the east side of M13 in the 40-inch refractor at Yerkes Observatory, but have yet to find it in any other telescope. Such dust lanes are supposed to be visible in smaller scopes. Look closely away from the central core and see if there are small areas devoid of stars. Scientists are still not sure if the dust is within the clusters or in the foreground.

Finally, look for strings of stars in many globulars. Sometimes you have to concentrate hard on the clusters until the line patterns stand out. Other times the patterns are easily discernible. In M30 in Capricornus, 2 such strings are obvious, giving the cluster its unique look.

So the next time you look at globular clusters, look for the things that make them different from each other rather than quickly looking at them and assuming they look the same. Then spend a little extra time to relish each cluster's unique beauty. ☛

NEXT ISSUE: LESSON THREE: LOCATING MERCURY, URANUS, AND NEPTUNE

Table 1:
Farthest Messier Globular Clusters

Name	Constellation	Distance	Size	Magnitude
M72	Aquarius	60,000 ly	4'	9½
M75	Sagittarius	60,000 ly	4'	8½
M54	Sagittarius	60,000 ly	6'	8
M53	Coma Berenices	60,000 ly	8'	8

Table 2:
Closest and Brightest Globular Clusters

Name	Constellation	Distance	Size	Magnitude
M4	Scorpius	8,000 ly	20'	6
M22	Sagittarius	10,000 ly	20'	5
Omega Cent.	Centarus	15,000 ly	30'	3½
47 Tucanae	Tucana	15,000 ly	25'	4

50 Years ago:

COMET KOHOUTEK

R.P. Van Zandt attended the North Central Regional Meeting of the Astronomical League and acquired the following information and charts from Dr. Sherman W. Schultz of Macalester Planetarium:

A BRIEF RESUME OF PREDICTIONS FOR COMET KOHOUTEK, 1973 f

These notes are based on circulars sent out by the Smithsonian Astrophysical Observatory. This new comet was discovered by Dr. Kohoutek at about the distance Jupiter orbits, 5.2 A.U.'s. Some estimates for the diameter of the nucleus runs to 100 miles. With a volume of ices so large to start with and with a near point to the sun now calculated to be .141 A.U., (much less than the orbit of Mercury,) the thermal conditions seen by this object should allow formation of an extremely long and bright tail structure. It will move close to the plane of the ecliptic. Prior to Dec. 28th or so, this object will be closing in on the sun and seen in the early morning sky prior to sunrise. It may reach a maximum brightness of -10 magnitude at perihelion. The brightness changes as predicted are remarkably fast compared to the "common" type of comet and it should present to the astrophotographer some challenging material. This could well be the most spectacular comet of the century and will probably be worth every bit of extra effort put into making good observations. Good Hunting!

Interesting fact is we can see Comet Kohoutek in 75,000 years and it was known as the comet of spectacular disappointment.

Submission of photos / article content for the Starlite: Jesse Hoover

If you have a photo that you would like to submit for the Starlite, please send these to Jesse Hoover hooveje@gmail.com or Dan Son sonshine1992@gmail.com along with a little write-up about the photo. Photos can be from star parties, club events, personal view, etc. Astrophotography is encouraged. Also, if you have educational content, tips, techniques, lessons learned or how-to articles with photos, we encourage that material for the Starlite. We can also put these on our Facebook page if you so desire. <https://www.facebook.com/PeoriaAstronomicalSociety>

The Caterpillar Matching Gifts Program: Brian Hakes

Employees/Retirees are asked to submit matching gift forms electronically via the Caterpillar Foundation website, www.caterpillar.com/foundation. The process is easy. Once you made your gift to the PAS you can go online to the Cat Foundation website and complete the electronic form, there is no paper involved. Once the form is registered with the foundation they will notify the PAS and the treasurer will then verify the gift has been received. Because there will be no mailings, the turnaround time for the whole process will be negligible. This is especially advantageous at the end of the calendar (tax) year. This is an excellent way to support the PAS. If you can, please participate in this generous program. This is a great way to help the society and the promotion of astronomy in the greater Peoria area.

Reflector:

Reflector Magazine digital edition is available for download. You may access an archive of digital issues from the AL website by visiting:

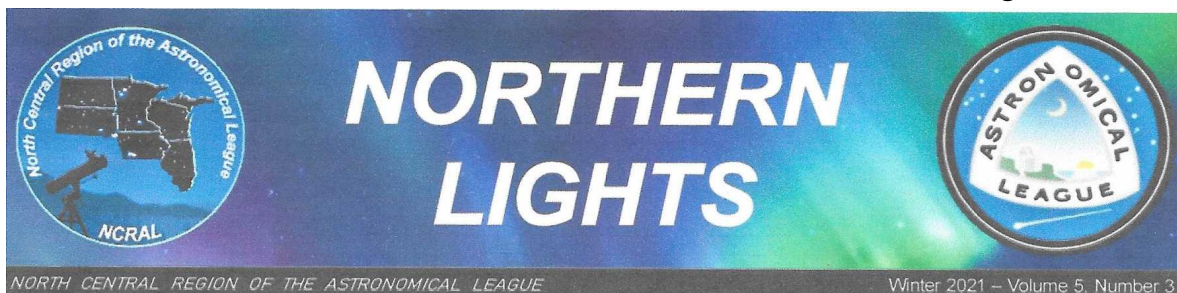
<https://www.astroleague.org/reflector>

NCRAL Newsletter:

The North-Central Region of the Astronomical League (NCRAL) is made up of member societies... the six states commonly thought of as the Upper Midwest of the USA, plus the Upper Peninsula of the state of Michigan. The PAS is a member of the NCRAL. Their Region Newsletter, also named "Northern Lights", has been resurrected and is better than ever! The latest issue's can be read on their website can be found here:

<https://ncral.wordpress.com/newsletter-archive/>

You can access the current issue and all other back issues through this link.



Add Your Email Address to NCRAL Member Database

Add your email address to the NCRAL member database now so that you can get direct mailings of NORTHERN LIGHTS and important and timely announcements about Regional conferences, star parties, and so forth. Your email address will never be shared with or sold to outside entities. Sign-up takes only about a minute. You'll need to provide your name, email address, astronomy club affiliation (including at-large), and indicate if you hold particular positions within your club. Go to the following case-sensitive URL to add your information to our database: <https://docs.google.com/forms/d/e/1FAIpQLSdGCQJiekrqVV3SY4BGrQdow5N7Elxv3VbX2YmFPA4AJZ2iag/viewform>

Program Schedule 2023-2024 possible final draft – All speakers confirmed

Meeting Time 7:00 p.m. CST/CDT (note new time)

Meeting in the Dome Planetarium at the Peoria Riverfront Museum (speakers via Zoom)

October 4, 2023 Astrophotography James Armstrong

November 1, 2023 The new generation of Smart Telescopes – with a live demonstration (outside if clear). Dr. Jim Sweitzer

December 6, 2023 The April 8,2024 Eclipse – Planing & sharing of members plans to observe + Oct 2023 Annual Eclipse recap

January 2023 No Meeting in January

February 7, 2024 New Full Dome Show

March 6, 2024 Titan Dr. James Dire

April 3, 2024 Astro-Jeopardy Brian Bill (+ summary of eclipse events)

May 1, 2024 The April 8 Eclipse recap – Members sharing experiance

Inclement weather notice: Monitor email (e-group), local radio stations or PAS Facebook Page if a program, board meeting, viewing, or star party may be canceled due to weather. If we determine a risk in the weather, the Society will cancel the event. If we host an event and you feel the weather or road conditions are questionable, please take the safest actions and do not attend the event.

Riverfront Planetarium Museum:

Our planetarium is celebrating its 60th anniversary this June, and we'd love you to celebrate with us! Peoria's planetarium opened on June 9, 1963 in Lakeview Park. It opened before the larger Lakeview Center opened, in 1965. Lakeview Center eventually became Lakeview Museum of Arts and Sciences. The planetarium was always central to the science education done at Lakeview. In 2012, the staff, collections, community solar system scale model, and planetarium equipment of Lakeview Museum all moved downtown and we became the Peoria Riverfront Museum.

We will be celebrating the 60th anniversary of the planetarium on June 17, 2023.

Stop by to see a new planetarium show *Incoming!*, participate in some astronomy related activities, eat a piece of cake, and enjoy a planetarium show contrasting what we knew about astronomy in 1963 with what we know today. In 1963, only a handful of astronauts and cosmonauts had been to space, and we hadn't yet landed on the Moon. We hadn't sent our spacecraft to the outer Solar System yet or launched the Hubble Space Telescope. We have learned and shared a lot in the past sixty years!

June 17 Schedule:

- Member Saturday: *Incoming!* 9:30 a.m. - 11 a.m.
- Space themed activities in the museum lobby 11 a.m. - 2 p.m.
- **Apollo 11: First Steps** in the Giant Screen Theater 11 a.m. and 2 p.m.
- Cake cutting in the museum lobby 12:30 p.m.
- **SPECIAL PLANETARIUM SHOW: Space Knowledge in 1963 vs Today** 3 p.m.



Photos from Members:



Jim Carroll M101 with Supernova showing



J Nowack M101 with Supernova



J Nowack Horsehead nebula 6 hours exposure William Optics Z73 scope



J Armstrong Hickson 61 the box

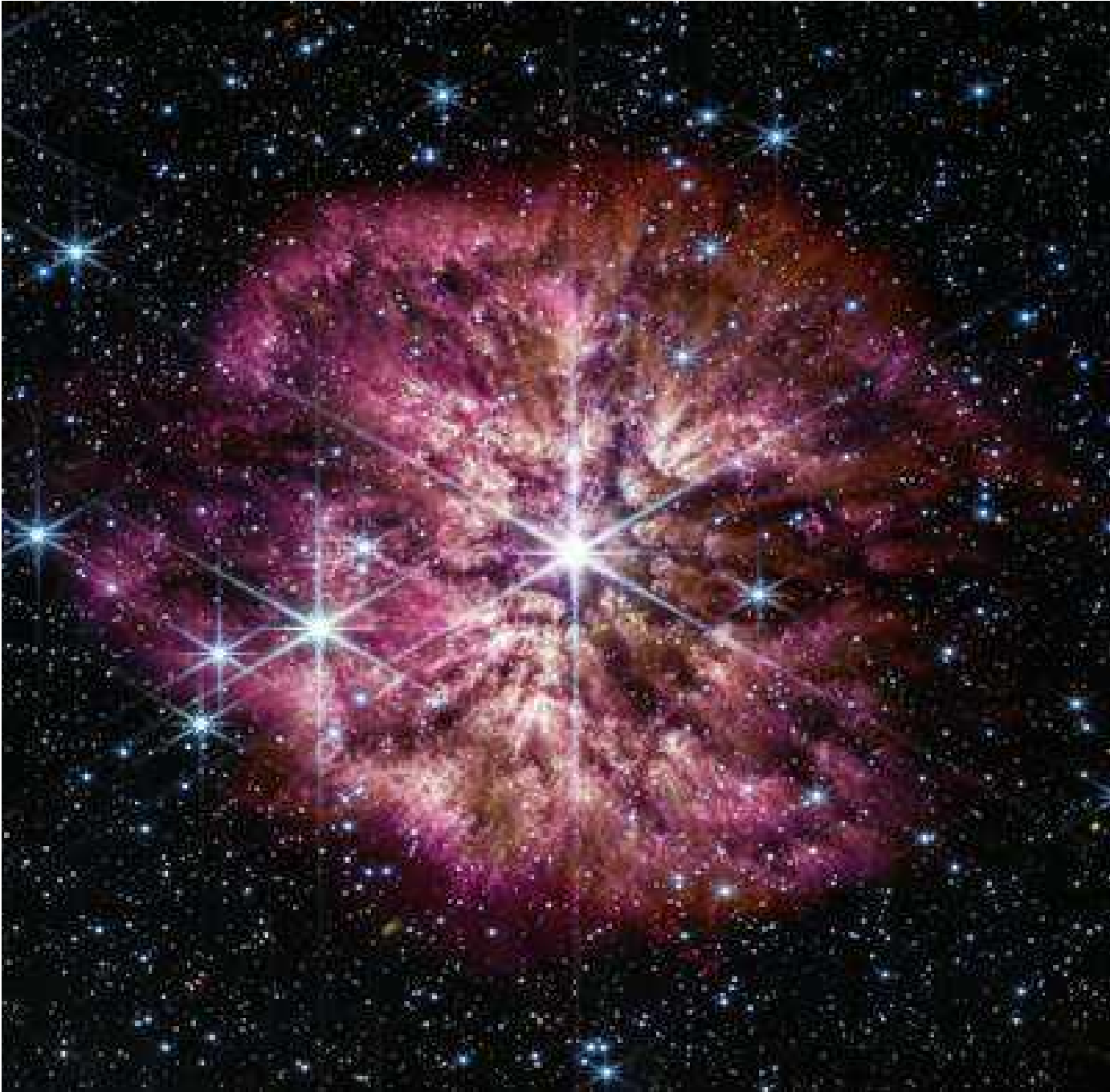


J Armstrong M27



J Armstrong Mammatus Clouds

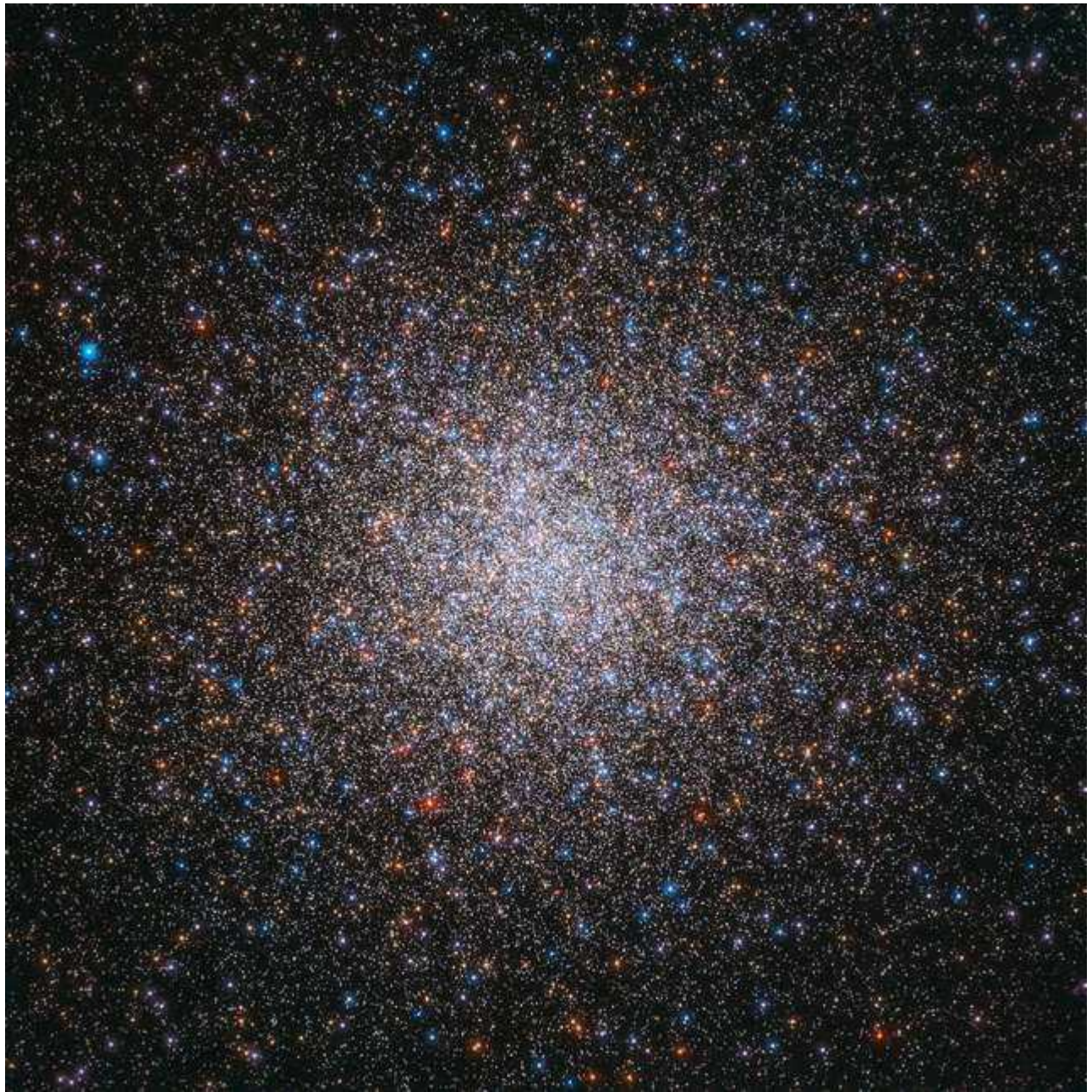
Photos from Space



Wolf-Rayet 124 by JWST

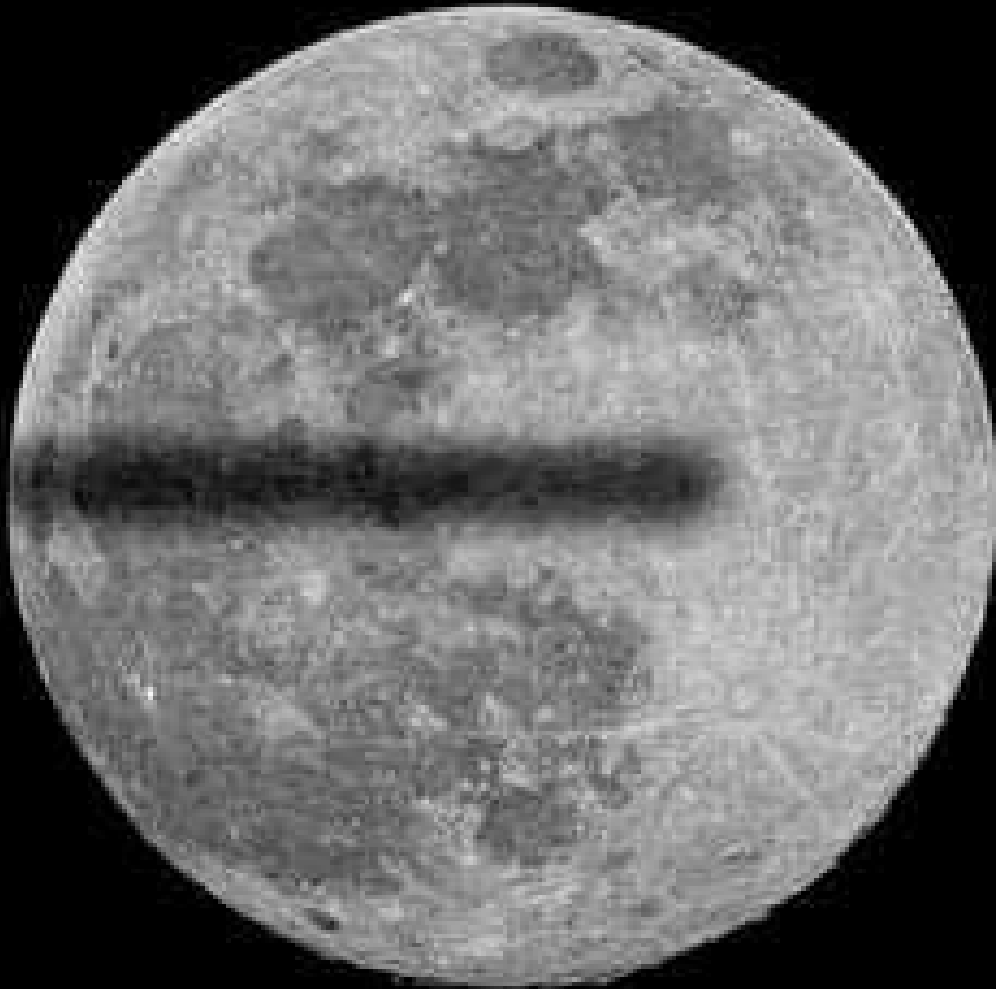


NGC298 from Hubble



M2 Globular Cluster from Hubble

FLAT EARTH



ECLIPSE

Last Lunar Eclipse from Flat Earth Society

Northmoor Hosting Schedule Dates for 2023

Date:	Keyholder	Helper 1	Helper 2
May 20	Sheldon Schafer	Brian Austin	Shannon Wiltz
May 27	Dan Son	Robyn MacDonald	
June 03	Phil Burroughs	Brian Bill	Sheldon Schafer
June 10	Sheldon Schafer	John Crow	Rodney Nordstrom
June 17	Gerald Horst	Jesse Hoover	Shannon Wiltz
June 24	Dave Grebner	John Manney	Brian Austin
July 01	John Lyle	Rodney Nordstrom	Robyn Crow
July 08	Dan Son	Trent Widmer	Phil Burroughs
July 15	Nick Rae	Shannon Wiltz	Brian Bill
July 22	Phil Burroughs	Brian Austin	
July 29	Gerald Horst	John Lyle	Dan Son
Aug 05	Dave Grebner	Robyn MacDonald	Jesse Hoover
Aug 12	John Lyle	Dan Son	Gerald Horst
Aug 19	Sheldon Schafer	Brian Austin	Rodney Nordstrom
Aug 26	Nick Rae	John Manney	
Sept 02	Phil Burroughs	Brian Bill	Trent Widmer
Sept 09	Dan Son	John Crow	John Manney
Sept 16	Gerald Horst	Dave Grebner	Sheldon Schafer
Sept 23	Sheldon Schafer	Jesse Hoover	
Sept 30	Dan Son	John Manney	Dave Grebner
Oct 07	John Lyle	Rodney Nordstrom	Dave Grebner
Oct 14	Nick Rae	Trent Widmer	John Crow
Oct 21	Dan Son	Shannon Wiltz	Brian Bill

Observe The Moon Night with Peoria Library is October 21st, everyone is welcome to join.

If you have a conflict with any dates, let me know as early as possible and ask the Northmoor group via PeoriaAstro@groups.io for help to switch dates with another member. PAS is down to 7 keyholders and 11 helpers. Thanks Everyone.

2023 Jubilee Maintenance Schedule		
(May 6th 2023 to Sep 30th 2023)		
May 6th	Jesse Hoover	Brandt Bechtold
May 13th	Eric Clifton	Dan Son
May 20th	Steve Russell	Jon Crow
May 27th	Jesse Hoover	Gary Bussman
June 3rd	Brian Bill	Dan Son
June 10th	Eric Clifton	Brandt Bechtold
June 17th	Jesse Hoover	Jon Crow
June 24th	Steve Russell	Dan Son
July 1st	Jesse Hoover	Gary Bussman
July 8th	Eric Clifton	Brian Bill
July 15th	Dan Son	Brandt Bechtold
July 22nd	Jon Crow	Steve Russell
July 29th	Jesse Hoover	Eric Clifton
Aug 5th	Jesse Hoover	Gary Bussman
Aug 12th	Brian Bill	Dan Son
Aug 19th	Brandt Bechtold	Steve Russell
Aug 26th	Jon Crow	Eric Clifton
Sept 2nd	Jesse Hoover	Gary Bussman
Sept 9th	Brian Bill	Dan Son
Sept 16th	Jon Crow	Steve Russell
Sept 23rd	Jesse Hoover	Gary Bussman
Sept 30th	Brandt Bechtold	Brian Bill

Responsibilities:

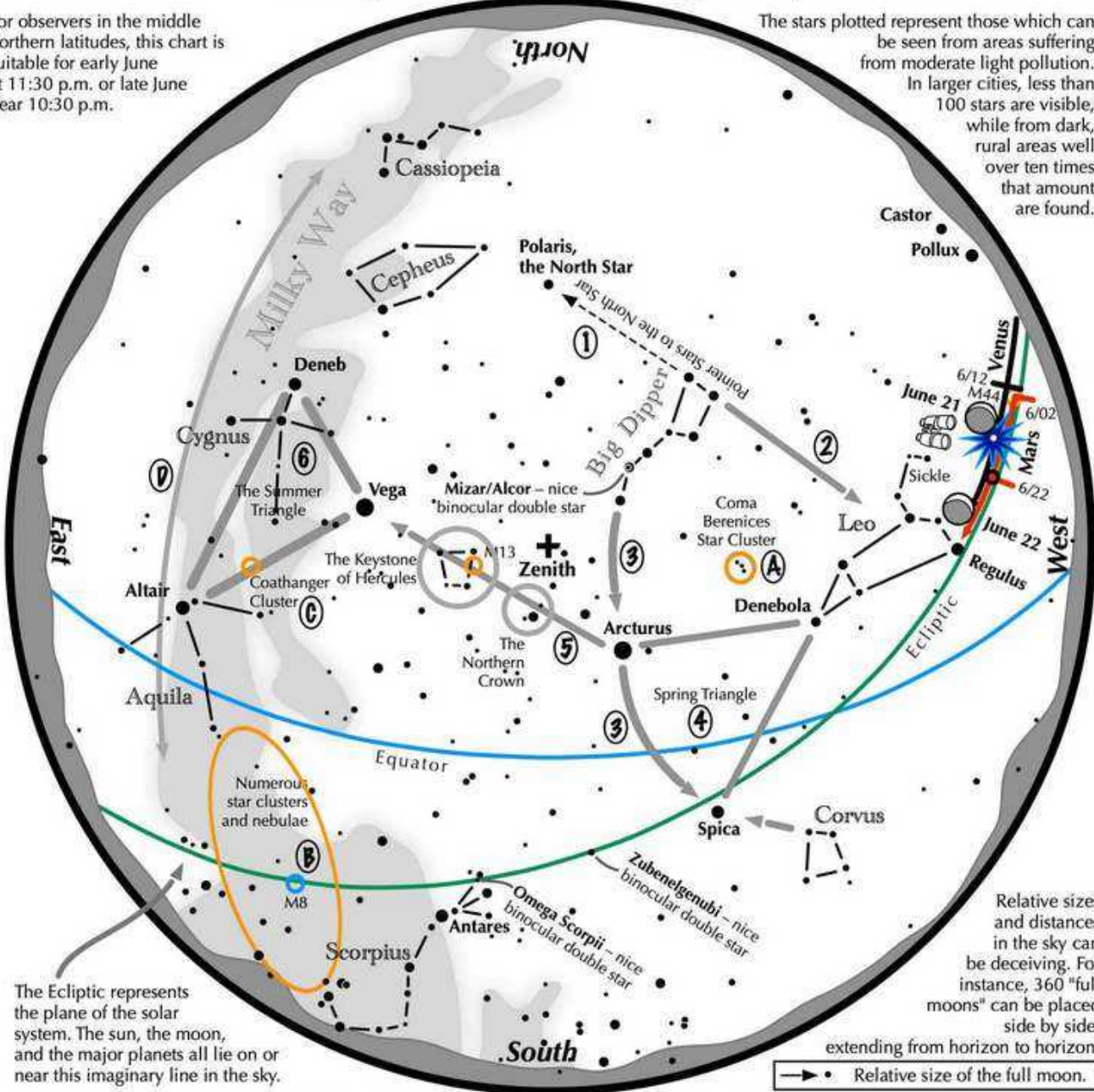
- * Check each building to ensure security of equipment.
- * Sweep floors, mow lawn and trim around buildings, blow or sweep off grass clippings from walkways.
- * Mowing once a week will help prevent clumping and the need to sweep up clumps.
- * Bring gas to top off mower tank. Currently there is no line trimmer at Jubilee.
- * Since only two people are scheduled each week, it is imperative they ensure that someone goes to Jubilee and perform scheduled tasks.
- * Please notify me of any schedule conflicts or problems with the equipment.

Jesse Hoover: 309-258-0343

Navigating the June Night Sky

For observers in the middle northern latitudes, this chart is suitable for early June at 11:30 p.m. or late June near 10:30 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 June night sky: Simply start with what you know or with what you can easily find.

- 1 Extend a line north from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
- 2 Draw another line in the opposite direction. It strikes the constellation Leo high in the west.
- 3 Follow the arc of the Dipper's handle. It first intersects Arcturus, the brightest star in the June evening sky, then Spica.
- 4 Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.
- 5 To the northeast of Arcturus shines another star of the same brightness, Vega. Draw a line from Arcturus to Vega. It first meets "The Northern Crown," then the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.
- 6 High in the east are the three bright stars of the Summer Triangle: Vega, Altair, and Deneb.

Binocular Highlights

- A: Between Denebola and the tip of the Big Dipper's handle, lie the stars of the Coma Berenices Star Cluster.
- B: Between the bright stars of Antares and Altair, hides an area containing many star clusters and nebulae.
- C: 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger.
- D: Sweep along the Milky Way for an astounding number of faint glows and dark bays.

