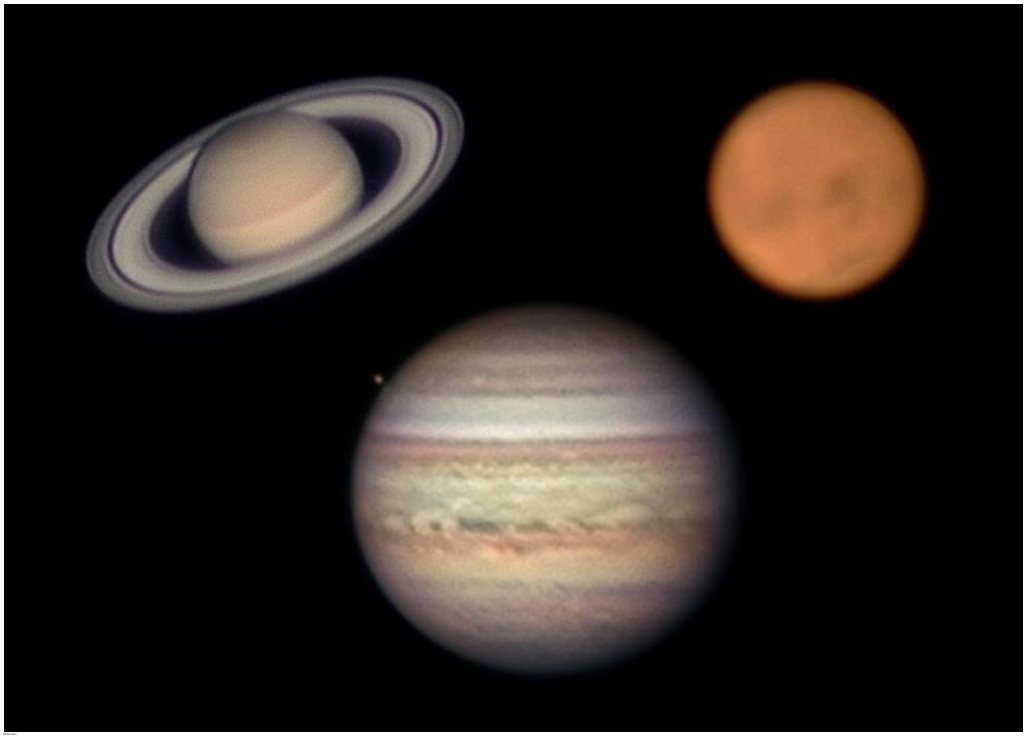

The Milford Observer

August 2018

PLANETARY IMAGES BY TONY LICATA, GMAC OPEN OBSERVING NIGHT, JULY 13, 2018

SHARE THE NIGHT SKY

Welcome to August!

The hot days of summer are often some of the best for astronomy in Michigan and this year has been no exception. In fact, I think it seems a little better than usual, but I don't have any data to support that theory. The dry weather, that has been plaguing our farmers and our lawns in July, has been blessing astronomers with clear skies and a welcome lack of dew on the optics, which is often the bane of the Michigan astronomer.

McMath-Hulbert Observatory Visit

Thanks to everyone who attended the observatory tour on July 28th in Lake Angelus, Michigan. I think we all learned a great deal about the history and technical capability of the facility. In the picture at right, you can see our tour group inspecting a giant Maksutov-Cassegrain telescope, which is mounted in Tower 2, next to a very cool piece of 1930's sun-tracking mirror technology, called a coelostat. We would like to extend a special thanks to Jim Shedlowsky for donating his time and sharing his knowledge. To read about our visit and learn more about the observatory, visit this article on our website, under News:

McMath-Hulbert Observatory Debriefing

Jim Shedlowsky led GMAC members on a tour of the historic McMath-Hulbert Observatory, on July 28th.

2018 Memberships

As of August 1st, our club has 24 members, which I think is not too shabby for our first full year of operation. With every event we host, we are making more connections and I am pleased with our rate of growth as a new club. If you are interested in purchasing a 2018 membership, it's not too late! We are still planning some exciting members-only tours, in the remainder of 2018, including a visit to Cranbrook on October 16th. For a full list of member benefits, visit our Membership Page.

Equipment Rental Program

Our club has purchased a telescope and a couple of pairs of binoculars, which are available to club members to use on their own time, on a first-come, first-serve basis. Since we purchased our scope in mid-June, it has been in continuous use by our members and the feedback has been very positive! Mohammed Behroozi (pictured at left), was the first to rent the scope, and it was later rented by Conrad Davillier, and Moin Shariff.

4.5" ORION SKYQUEST DOBSONIAN

- Compact and lightweight, yet sturdy – a perfect telescope for traveling or easy trips to the backyard at home
- 4.5″ aperture and 900mm focal length provide clear views of lunar craters on the Moon, planets, bright nebulas and galaxies
- Eyepiece kit includes: 8-24 mm zoom, 32mm, and a 3x Barlow

If you are interested in renting the club telescope or binoculars, please email Jim Goodall at james.a.goodall@gm.com.

COMING SOON… CLUB MERCHANDISE!

Our club secretary (and my wife) Moriah has been working diligently to create some club merchandise, which will be available for sale, both on our website and at the Astronomy at the Beach event. Here's a sneak preview of some of the products you may see soon, bearing our club logo (designed by our Senior Astronomer, Tony Licata).

Find Us Online

Website: www.gmastronomy.com

Facebook: www.facebook.com/GMAstronomy

Twitter: @GMAstronomy

Instagram: @GMAstronomy

Website Recommendations

The Sky Live – www.theskylive.com

Heavens Above – www.heavens-above.com

Stellarium – www.stellarium.org

Equipment Recommendations

There are many different types of telescopes, and the choice is very much dependent on the interests of the individual, but these are some general recommendations:

Binoculars - Celestron SkyMaster – Celestron makes a few levels of binoculars if you are just starting out and not sure you want to buy a telescope or even if you want something small and compact to view space on the go.

Beginner Telescope - Orion 10014 SkyQuest XT4.5 Classic Dobsonian Telescope - this telescopeis easy to use and great for beginners. The size makes it easy to place on the ground for children to see.

Intermediate Telescope - Celestron Advanced VX 8in Schmidt-Cassegrain (SCT) Telescope: the Celestron C8 on an equatorial mount, an excellent scope for intermediate users. The long focal length lends well to planetary viewing, although it is still very capable for deep sky observing and astrophotography.

Accessories

Head Lamp - Coleman Divide+ 225 lm LED Headlamp with Battery Lock - this to be a good headlamp for star parties because it has a red lamp and you don't have to cycle through all the bright modes to turn it on and off. It is also very bright when you need it to be.

Cell Phone Holder - Gosky Universal Cell Phone Adapter Mount – this is a fun accessory to have to take some basic images and share what you are seeing with others online.

Star Finder - The Night Sky 40°-50° (Large) Star Finder – this is nice to have on hand even if you don't have a telescope but wish to learn more about constellations.

Upcoming Events

Looking forward to seeing all of you at these exciting upcoming events. Our August Open Observing Night is this Friday, and the currently the weather forecast looks clear (keep your fingers crossed). Also new in late August, we just added Fenton Sidewalk Astronomy to the calendar, and Tom Large and I will be scouting out a good observing location for this new venue in downtown Fenton.

Open Observing Night X
Friday, August 10, 7:30 PM - 11:30 PM
@ GM Milford Proving Ground Softball Fields

Fenon Sidewalk Astronomy
Thursday, August 23 @ 7:30 PM - 10:30 PM
@ Downtown Fenton, near the Fire Hall

Fenton Sidewalk Astronomy
Thursday, August 30 @ 7:30 PM - 10:30 PM
@ Downtown Fenton, near the Fire Hall

Please note that we cancelled the September Observing Night, because there are two other big Michigan astronomy events already in September, the Great Lakes Star Gaze in Gladwin and Astronomy at the Beach in Brighton. Also, stay tuned for more info on the Visit to Cranbrook, mentioned above.

Contact Info

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Tony Licata – Senior Astronomer
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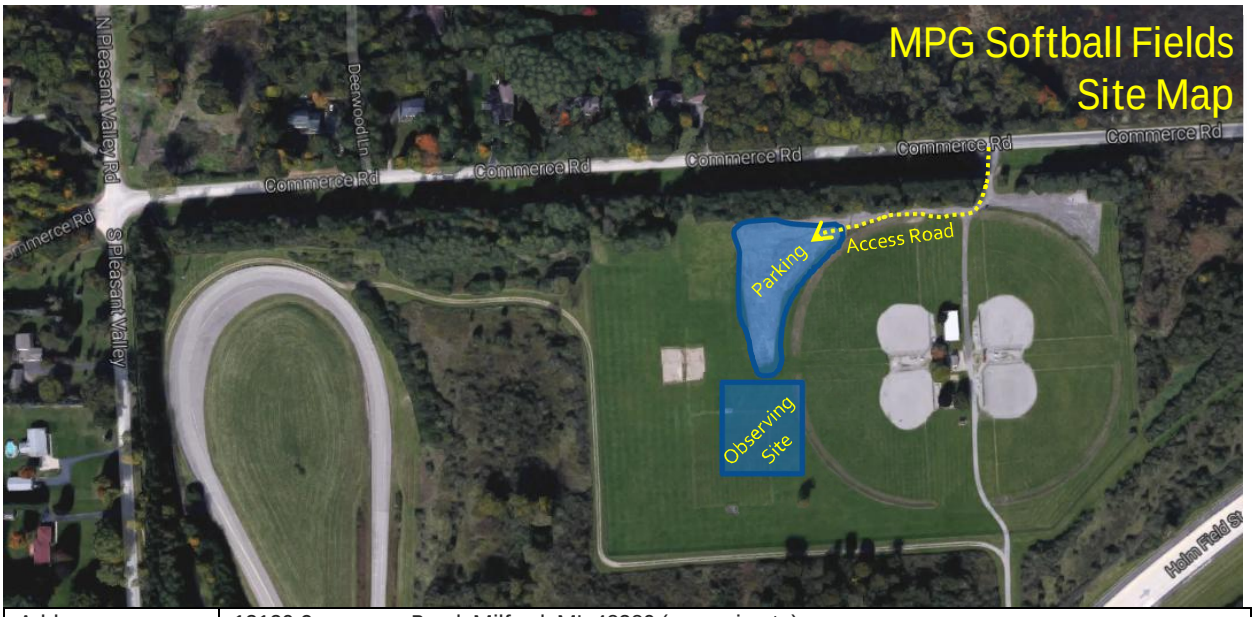
MPG Open Observing Nights

The General Motors Astronomy Club (GMAC) hosts monthly open observing nights at the Milford Proving Ground Softball Fields, typically on the Friday closest to the new moon, with Saturday as a rain date (or cloud date). These events are open to the general public, but the attached liability waiver is required for non-GM-employees. No badge or drive access is needed. Members and non-members are encouraged to bring their own telescope or photography equipment, but, of course, no equipment is required to participate.



Address:	13120 Commerce Road, Milford, MI, 48380 (approximate)
Position:	42°36'15"N 83°41'49"W (42.604167 -83.696944) Elevation: 303 meters (995 feet)
Hours:	Gates open one hour before sunset and close when the last car leaves.
Contacts:	Jim Goodall, GM Astronomy Club, +1 586 709 5888. james.a.goodall@gm.com MPG Security Emergency: +1 248 685 5911

The following etiquette is expected at all GMAC-hosted observing nights:

1) Park your vehicle such that the headlights are pointed away from the observing area, in case you need to leave early. If your schedule permits, please try to arrive before sunset.

2) Minimize the use of bright white lights at the site, as they affect night vision and astrophotography. A small red flashlight is acceptable.

3) In warm weather, bug spray is recommended to keep the mosquitos at bay, but be careful not to apply it near the telescopes as it can damage the optics.

4) Always ask before approaching telescopes and be careful not to bump the scope or trip over wires. Most amateur astronomers enjoy sharing their telescopes with others, but it is important to respect their equipment and wait for an invite before putting your eye to the eyepiece.

5) Cameras are allowed and encouraged for astrophotography and group photos. However it is strictly forbidden to photograph vehicles on GM property, regardless of the security status of the vehicle. Be careful not to include ANY vehicles in your photographs.

Clear Skies!

The Evening Sky Map

FREE* EACH MONTH FOR YOU TO EXPLORE, LEARN & ENJOY THE NIGHT SKY

WWW.SKYMAPS.COM

NORTHERN HEMISPHERE
AUGUST 2018

Sky Calendar – August 2018

Get Sky Calendar on Twitter
http://twitter.com/skymaps

4 **Last Quarter Moon** at 18:19 UT.

6 **Moon near the Pleiades** at 3h UT (morning sky).

6 **Moon near Aldebaran** (morning sky) at 19h UT.

9 **Mercury at inferior conjunction** with the Sun at 2h UT. Mercury passes into the morning sky. Not visible.

9 **Moon near Castor** (morning sky) at 15h UT.

9 **Moon near Pollux** (morning sky) at 19h UT.

10 **Moon at perigee** (closest to Earth) at 18:10 UT (358,078 km; angular size 33.4').

11 **Partial Eclipse of the Sun** at 9:46 UT (greatest). Visible from northern Europe and NE Asia. Begins at 8:02 and ends at 11:31 UT.

11 **New Moon** at 9:58 UT. Start of lunation 1183.

12 **Perseid meteor shower peaks** at 20h UT. Peak lasts about 12 hours. Active from July 17 to August 24. Produces swift, bright meteors (50 to 100 per hour) many with persistent trains. Best viewing is after midnight. Favorable conditions in 2018.

12 **Moon near Regulus** (evening sky) at 4h UT.

14 **Moon near Venus** (evening sky) at 18h UT. Mag. –4.3.

15 **Moon near Spica** (evening sky) at 22h UT.

17 **Moon near Jupiter** (evening sky) at 13h UT. Mag. –2.0.

17 **Venus at greatest elongation east** (46° from Sun, evening sky) at 17h UT. Mag. –4.3.

18 **First Quarter Moon** at 7:49 UT.

19 **Moon near Antares** (evening sky) at 13h UT.

21 **Moon near Saturn** (evening sky) at 10h UT. Mag. 0.3.

23 **Moon at apogee** (farthest from Earth) at 11h UT (distance 405,746 km; angular size 29.4').

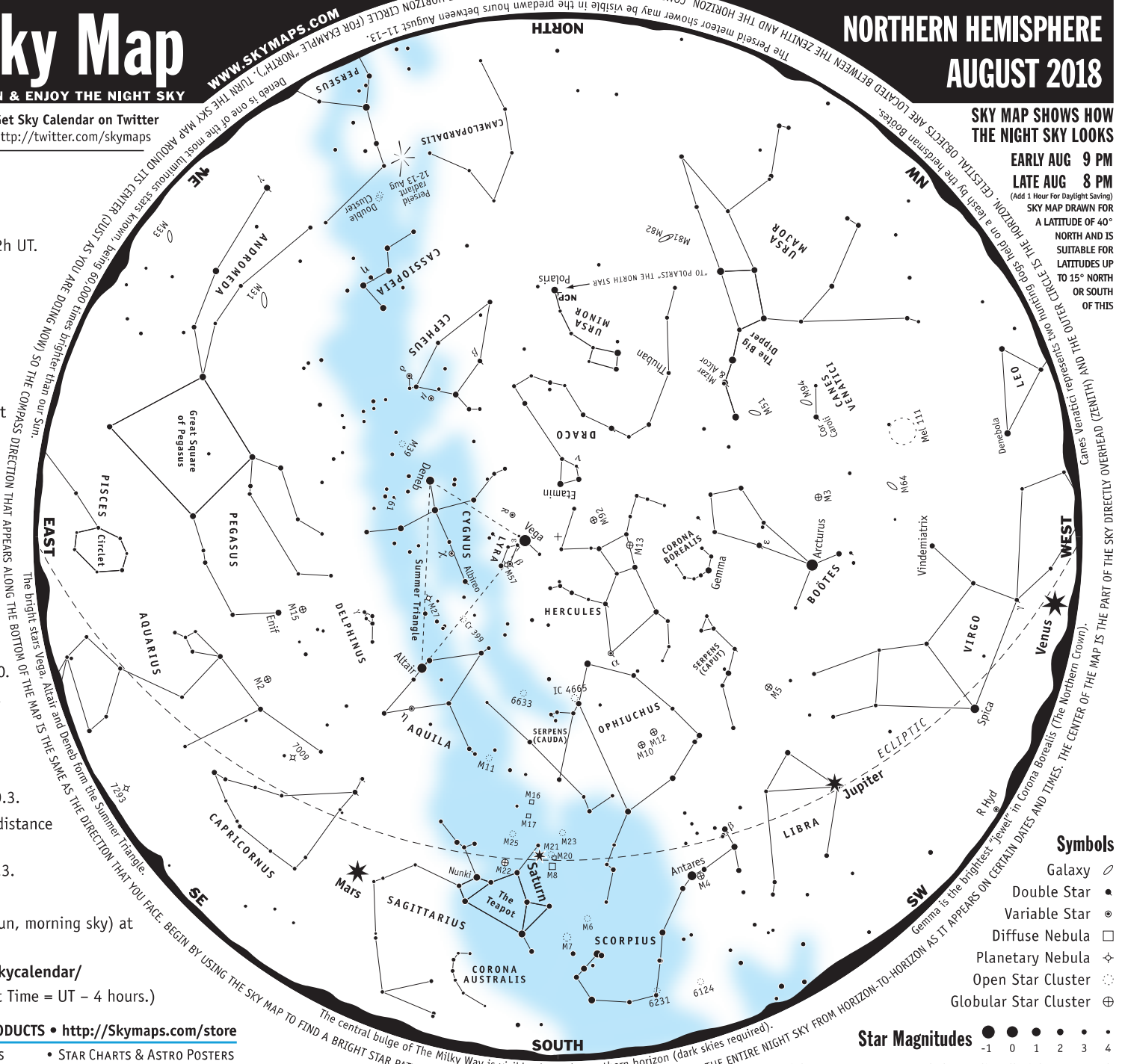
23 **Moon near Mars** (evening sky) at 16h UT. Mag. –2.3.

26 **Full Moon** at 11:57 UT.

26 **Mercury at greatest elongation west** (18° from Sun, morning sky) at 20h UT. Mag. –0.1.

More sky events and links at http://Skymaps.com/skycalendar/

All times in Universal Time (UT). (USA Eastern Daylight Time = UT – 4 hours.)



Deneb is one of the most luminous stars known, being 60,000 times brighter than our Sun, so the compass direction that appears along the bottom of the map is the same as the direction that you face. Begin by using the sky map to find a bright star pattern in the sky.

The compass directions are indicated along the horizon circle (for example, "north"). Turn the sky map around its center (just as you are doing now) so the compass direction that appears along the bottom of the map is the part of the sky directly overhead (zenith) and the outer circle is the horizon. Celestial objects are located between the zenith and the horizon.

SKY MAP SHOWS HOW THE NIGHT SKY LOOKS

EARLY AUG 9 PM
LATE AUG 8 PM
(Add 1 Hour For Daylight Saving)

SKY MAP DRAWN FOR A LATITUDE OF 40° NORTH AND IS SUITABLE FOR LATITUDES UP TO 15° NORTH OR SOUTH OF THIS

Symbols

- Galaxy
- Double Star
- Variable Star
- Diffuse Nebula
- Planetary Nebula
- Open Star Cluster
- Globular Star Cluster

Star Magnitudes -1 0 1 2 3 4

INSTRUCTIONS: THE SKY MAP SHOWS THE ENTIRE NIGHT SKY FROM HORIZON-TO-HORIZON AS IT APPEARS ON CERTAIN DATES AND TIMES. THE CENTER OF THE MAP IS THE PART OF THE SKY DIRECTLY OVERHEAD (ZENITH).

About the Celestial Objects

Listed on this page are several of the brighter, more interesting celestial objects visible in the evening sky this month (refer to the monthly sky map). The objects are grouped into three categories. Those that can be easily seen with the naked eye (that is, without optical aid), those easily seen with binoculars, and those requiring a telescope to be appreciated. **Note, all of the objects (except single stars) will appear more impressive when viewed through a telescope or very large binoculars.** They are grouped in this way to highlight objects that can be seen using the optical equipment that may be available to the star gazer.

Tips for Observing the Night Sky

When observing the night sky, and in particular deep-sky objects such as star clusters, nebulae, and galaxies, it's always best to observe from a dark location. Avoid direct light from street lights and other sources. If possible observe from a dark location away from the light pollution that surrounds many of today's large cities.

You will see more stars after your eyes adapt to the darkness—usually about 10 to 20 minutes after you go outside. Also, if you need to use a torch to view the sky map, cover the light bulb with red cellophane. This will preserve your dark vision.

Finally, even though the Moon is one of the most stunning objects to view through a telescope, its light is so bright that it brightens the sky and makes many of the fainter objects very difficult to see. So try to observe the evening sky on moonless nights around either New Moon or Last Quarter.

Astronomical Glossary

Conjunction – An alignment of two celestial bodies such that they present the least angular separation as viewed from Earth.

Constellation – A defined area of the sky containing a star pattern.

Diffuse Nebula – A cloud of gas illuminated by nearby stars.

Double Star – Two stars that appear close to each other in the sky; either linked by gravity so that they orbit each other (binary star) or lying at different distances from Earth (optical double). Apparent separation of stars is given in seconds of arc (").

Ecliptic – The path of the Sun's center on the celestial sphere as seen from Earth.

Elongation – The angular separation of two celestial bodies. For Mercury and Venus the greatest elongation occurs when they are at their most angular distance from the Sun as viewed from Earth.

Galaxy – A mass of up to several billion stars held together by gravity.

Globular Star Cluster – A ball-shaped group of several thousand old stars.

Light Year (ly) – The distance a beam of light travels at 300,000 km/sec in one year.

Magnitude – The brightness of a celestial object as it appears in the sky.

Open Star Cluster – A group of tens or hundreds of relatively young stars.

Opposition – When a celestial body is opposite the Sun in the sky.

Planetary Nebula – The remnants of a shell of gas blown off by a star.

Universal Time (UT) – A time system used by astronomers. Also known as Greenwich Mean Time. USA Eastern Standard Time (for example, New York) is 5 hours behind UT.

Variable Star – A star that changes brightness over a period of time.

CELESTIAL OBJECTS

NORTHERN HEMISPHERE

AUGUST 2018

Skymaps.com

Easily Seen with the Naked Eye

Altair	Aql	●	Brightest star in Aquila. Name means "the flying eagle". Dist=16.7 ly.
Arcturus	Boo	●	Orange, giant K star. Name means "bear watcher". Dist=36.7 ly.
δ Cephei	Cep	◉	Cepheid prototype. Mag varies between 3.5 & 4.4 over 5.366 days. Mag 6 companion.
Deneb	Cyg	●	Brightest star in Cygnus. One of the greatest known supergiants. Dist=1,400±200 ly.
α Herculis	Her	◉	Semi-regular variable. Magnitude varies between 3.1 & 3.9 over 90 days. Mag 5.4 companion.
Vega	Lyr	●	The 5th brightest star in the sky. A blue-white star. Dist=25.0 ly.
Antares	Sco	●	Red, supergiant star. Name means "rival of Mars". Dist=135.9 ly.
Polaris	UMi	●	The North Pole Star. A telescope reveals an unrelated mag 8 companion star. Dist=433 ly.
Spica	Vir	●	Latin name means "ear of wheat" and shown held in Virgo's left hand. Dist=250 ly.

Easily Seen with Binoculars

M31	And	⬭	The Andromeda Galaxy. Most distant object visible to naked eye. Dist=2.5 million ly.
η Aquilae	Aql	◉	Bright Cepheid variable. Mag varies between 3.6 & 4.5 over 7.166 days. Dist=1,200 ly.
M3	CVn	⊕	Easy to find in binoculars. Might be glimpsed with the naked eye.
μ Cephei	Cep	◉	Herschel's Garnet Star. One of the reddest stars. Mag 3.4 to 5.1 over 730 days.
χ Cygni	Cyg	◉	Long period pulsating red giant. Magnitude varies between 3.3 & 14.2 over 407 days.
M39	Cyg	⁘	May be visible to the naked eye under good conditions. Dist=900 ly.
ν Draconis	Dra	●	Wide pair of white stars. One of the finest binocular pairs in the sky. Dist=100 ly.
M13	Her	⊕	Best globular in northern skies. Discovered by Halley in 1714. Dist=23,000 ly.
M92	Her	⊕	Fainter and smaller than M13. Use a telescope to resolve its stars.
ε Lyrae	Lyr	●	Famous Double Double. Binoculars show a double star. High power reveals each a double.
R Lyrae	Lyr	◉	Semi-regular variable. Magnitude varies between 3.9 & 5.0 over 46.0 days.
M12	Oph	⊕	Close to the brighter M10. Dist=18,000 ly.
M10	Oph	⊕	3 degrees from the fainter M12. Both may be glimpsed in binoculars. Dist=14,000 ly.
IC 4665	Oph	⁘	Large, scattered open cluster. Visible with binoculars.
6633	Oph	⁘	Scattered open cluster. Visible with binoculars.
M15	Peg	⊕	Only globular known to contain a planetary nebula (Mag 14, d=1"). Dist=30,000 ly.
M8	Sgr	□	Lagoon Nebula. Bright nebula bisected by a dark lane. Dist=5,200 ly.
M25	Sgr	⁘	Bright cluster located about 6 deg N of "teapot's" lid. Dist=1,900 ly.
M22	Sgr	⊕	A spectacular globular star cluster. Telescope will show stars. Dist=10,000 ly.
M4	Sco	⊕	A close globular. May just be visible without optical aid. Dist=7,000 ly.
M6	Sco	⁘	Butterfly Cluster. 30+ stars in 7x binoculars. Dist=1,960 ly.
M7	Sco	⁘	Superb open cluster. Visible to the naked eye. Age=260 million years. Dist=780 ly.
M5	Ser	⊕	Fine globular star cluster. Telescope will reveal individual stars. Dist=25,000 ly.
Mizar & Alcor	UMa	●	Good eyesight or binoculars reveals 2 stars. Not a binary. Mizar has a mag 4 companion.
Cr 399	Vul	⁘	Coathanger asterism or "Brocchi's Cluster". Not a true star cluster. Dist=218 to 1,140 ly.

Telescopic Objects

7009	Aqr	✧	Saturn Nebula. Requires 8-inch telescope to see Saturn-like appendages.
ε Boötis	Boo	●	Red giant star (mag 2.5) with a blue-green mag 4.9 companion. Sep=2.8". Difficult to split.
M94	CVn	⬭	Compact nearly face-on spiral galaxy. Dist=15 million ly.
M51	CVn	⬭	Whirlpool Galaxy. First recognised to have spiral structure. Dist=25 million ly.
M64	Com	⬭	Black-Eye Galaxy. Discovered by J.E. Bode in 1775 - "a small, nebulous star".
Albireo	Cyg	●	Beautiful double star. Contrasting colours of orange and blue-green. Sep=34.4".
61 Cygni	Cyg	●	Attractive double star. Mags 5.2 & 6.1 orange dwarfs. Dist=11.4 ly. Sep=28.4".
γ Delphini	Del	●	Appear yellow & white. Mags 4.3 & 5.2. Dist=100 ly. Struve 2725 double in same field.
β Lyrae	Lyr	◉	Eclipsing binary. Mag varies between 3.3 & 4.3 over 12.940 days. Fainter mag 7.2 blue star.
M57	Lyr	✧	Ring Nebula. Magnificent object. Smoke-ring shape. Dist=4,100 ly.
M23	Sgr	⁘	Elongated star cluster. Telescope required to show stars. Dist=2,100 ly.
M20	Sgr	□	Trifid Nebula. A telescope shows 3 dust lanes trisecting nebula. Dist=5,200 ly.
M21	Sgr	⁘	A fine and impressive cluster. Dist=4,200 ly.
M17	Sgr	□	Omega Nebula. Contains the star cluster NGC 6618. Dist=4,900 ly.
M11	Sct	⁘	Wild Duck Cluster. Resembles a globular through binoculars. V-shaped. Dist=5,600 ly.
M16	Ser	□	Eagle Nebula. Requires a telescope of large aperture. Dist=8,150 ly.
M81	UMa	⬭	Beautiful spiral galaxy visible with binoculars. Easy to see in a telescope.
M82	UMa	⬭	Close to M81 but much fainter and smaller.
M27	Vul	✧	Dumbbell Nebula. Large, twin-lobed shape. Most spectacular planetary. Dist=975 ly.