



The Eyepiece



SW FL Astronomical Society, Inc.
PO Box 100127
Cape Coral FL 33910



NEW MEETING TIME - 7PM!

Ring Nebula By Linwood Ferguson
For info on the capture of this amazing
image, [click here](#).



Mike Jensen - Editor

Hi Everyone!
There is much going on in this month's issue! First I've taken

a suggestion from one of our newer members to heart and begun to include some content intended for "newbies" to astronomy. See my editorial comment on page 17.

Also, I've included a VERY informative tutorial on how to use Stellarium, one of the best 3D astronomy softwares on the market. Totally free to download.

This month's issue includes some great articles on the Summer Sky including a GREAT program pro-

vided by the Astronomical League! Also, I've included a nice tutorial on how to use Stellarium, a great read!

Summer presents some challenges here in SWFL. Unfortunately, rainy season brings clouds. Clouds which usually dissipate by about 9 or 10pm, but those occasionally "pop up" showers make for a nervous group of astrophotographers.

Our general meeting this month is July 7th with an "Overview of the Astronomical League Observing Programs" presentation from John MacLean!

The Astro SIG group meets on July 26th, a week later than normal.

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Monthly Meetings

Our monthly meetings are held on the **first Thursday** of each month. The meetings begin at 7:00pm.

This month's meeting will be a combined live and Zoom meeting! Masks are optional.

Each meeting will have the same link/meeting ID (see below).

So, mark your calendar for:

July 7, 2022
August 4, 2022
Sept. 1, 2022

How to use Zoom.

1. Download the software for smartphone, tablet or computer
Click the link sent out for the meeting.

<https://widener.zoom.us/j/96535769204>

Meeting ID: 965 3576 9204

One tap mobile:

+13126266799,,96535769204#
(or)
+16465588656,,96535769204#

2. Click on window that appears, "Join Zoom Meeting".

3. Then "Join Computer Audio"

4. On entering the meeting, audio is going to be "off" by default. Press down and hold your space bar to talk. Both Brian and the presenter will be unmuted by default. This is being

July Dates

Meetings

- **General Meeting July 7th - 7pm at the Planetarium & on Zoom**
- **Astro SIG July 26th @6:30pm - Zoom**
- **Supermoon July 13th**
- **New Moon July 28th**

PROGRAMS STEERING GROUP STATUS SUMMARY FOR July 2022

- The critical path item continues to be getting a reliable Internet connection for Planetarium Zoom meetings via wired Ethernet. A wireless access point was installed within the Planetarium dome for the June meeting but did not work properly. We reverted to the pre-existing wireless AP installed outside the dome. We have escalated the situation to Planetarium management. We have a database of excellent speaker candidates prepared, but are in limbo until this situation is resolved.

done to cut down on background noise, as it seems to accumulate as our numbers increase.

NEWSLETTER RECOGNIZED

The Eyepiece newsletter has been recognized as a runner up in the annual Astronomical League Mabel Sterns Newsletter competition for 2022.



Member

2022 Dues

If you have not sent in your check for your 2022 dues, please do so upon reading this announcement.

Dues are an affordable \$25.

To Renew Your Membership, or join as a new Member, please go to:

<https://theeyepiece.org/membership/>

President's Report

Brian Risley - SWFAS President

Summer is in full swing, so are the rains and mosquitoes.

The SIG photographers have been trying to get in any decent night in and have produced some nice images of some of the summer Milky Way objects.

John's program this month is on the Astronomical League Programs. There are new ones and ones aimed at beginners.

I hope everyone has a good 4th of July and clear skies.

Again, congratulations to Mike for the AL Newsletter Award Runner Up placement.



Club Officers & Positions

President/Equipment
 Brian Risley
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The Astronomical League Report

The Astronomical League

As a member of the Southwest Florida Astronomical Society you are automatically also a member of the Astronomical League, a nationwide affiliation of astronomy clubs. Membership in the AL provides a number of benefits for you including receipt of The Reflector, the AL's quarterly newsletter, use of the Book Service, through which you can buy astronomy related books at a 10% discount. You can also participate in the Astronomical League's Observing Clubs. The Observing Clubs offer encouragement and certificates of accomplishment for demonstrating observing skills with a variety of instruments and objects. These include the Messier Club, Binocular Messier Club, the Herschel 400 Club, the Deep Sky Binocular Club, and many others. To learn more about the Astronomical League and its benefits for you, visit <http://www.astroleague.org>



Reflector Magazine

You should have received an email from the Astronomical League linking to your digital copy of the June 2022 Quarterly Reflector magazine on around June 6, You can also directly access copies via the web at <https://www.astroleague.org/reflector>

ALCON 2022

The Astronomical League has announced that it will hold its National Convention in Albuquerque, New Mexico from July 28 – July 30. Full details are available at the following link: Astronomical League Convention | Hosted by The Albuquerque Astronomical Society (alcon2022.org)

The main conference will be held on Thursday, Friday, and Saturday and features speakers and workshops There will be an evening The special events include an evening presentation by Apollo 17 astronaut Harrison Schmitt on July 29 and a tour of the Karl Jansky Very large Array (VLA) on July 31. Discounted rates are available at The Embassy Suites.

Monthly highlight of the Astronomical League Observing Programs (Article prepared by SWFAS Astronomical League Coordinator John MacLean)

The Astronomical League Caldwell Observing Program

Last month we highlighted the Messier Observing program. This month we'll take a look at the Caldwell Observing program compiled by the late Sir Patrick Moore.

Caldwell Observing Program

As the Astronomical League introduction points out, the Messier list was originally compiled as a list of objects (faint fuzzies) to be avoided while searching for comets. The Caldwell List, on the other hand, was generated as a list of objects to be sought out for their beauty and interest and well worth the effort to go out of one's way (literally in the case of the full list!) to find.

The full Caldwell list contains 109 objects varying in magnitude from 1 to 13. Unlike the Messier list, the Cald-

well objects extend well into the southern hemisphere and so to log them all travel to the Southern hemisphere will be required.

However, the Astronomical League provides two levels of awards, one including just 70 objects which will allow observations to remain in the northern hemisphere and the other for the full list.

As is the case for the Messier observing programs, computer guided scopes are not allowed although the aperture requirement is a modest 6 inches.

The Caldwell list is mutually exclusive of the Messier list and is sequenced in order of Declination, North to South. Well known targets in the northern hemisphere include the Cat's Eye Nebula in Draco, the Sword Handle (Double Cluster) in Perseus, the Blinking Nebula and the North American Nebula in Cygnus, the Hyades and the Eskimo Nebula in Gemini.

Southern hemisphere targets include the Coal Sack and the Jewel Box cluster in Crux, The Tarantula Nebula in the Large Magellanic Cloud, and the globular cluster 47 Tucanae.

The awards for successful completion of either program consist of a certificate and a pin including a picture of two of Sir Patrick's favorite objects, the Cat's Eye Nebula and the Tarantula Nebula (see below).



The Night Sky Network



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!



Find Hercules and His Mighty Globular Clusters David Prosper

Hercules is one of the standout heroes of Greek mythology, but his namesake constellation can be surprisingly hard to find - despite being one of the largest star patterns in our night skies! Once you find the stars of Hercules, look deeper; barely hidden in the space around his massive limbs and “Keystone” asterism are two beautiful globular star clusters: M13 and M92!

Since the constellation itself is relatively dim but bordered by brighter constellations, you can find the stars of Hercules by looking between the bright stars Vega and Arcturus. They are fairly easy to identify, and we have tips on how to do so in previous articles. Vega is the brightest star in the constellation Lyra and one of the three stars that make up the Summer Triangle (June 2020: Summer Triangle Corner: Vega). Arcturus is the brightest star in the constellation Boötes, and can be found by “arc-ing to Arcturus” from the handle of the Big Dipper (May 2021: Virgo’s Galactic Harvest). You may be able to Hercules’s “Keystone” asterism first; this distinct pattern of four stars is traditionally shown as the torso of the great hero, though some illustrators prefer marking the Keystone as the head of Hercules. What pattern do you see in the stars of Hercules?

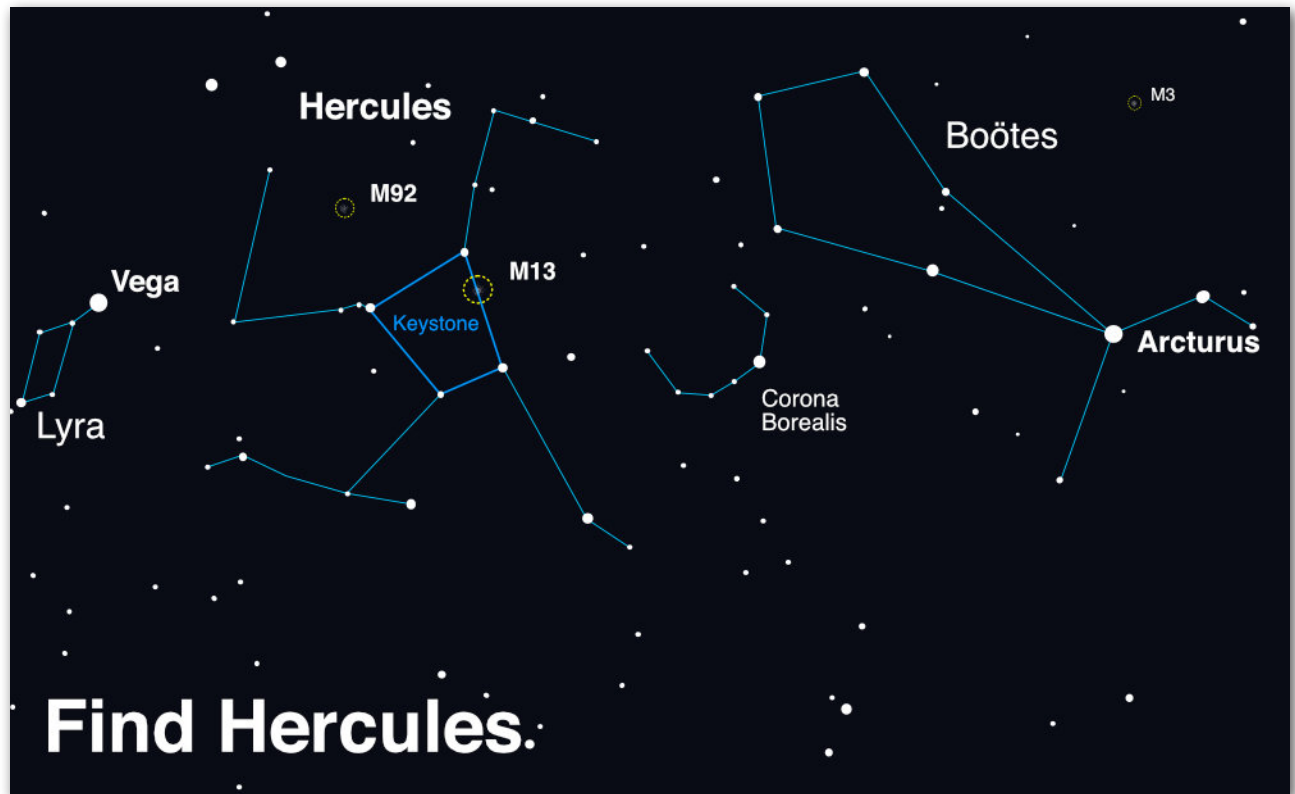
Globular star clusters appear “fluffy,” round, and dense with stars, similar to a dandelion gone to seed, in contrast to the more scattered and decentralized patterns of open clusters. Open clusters are generally made up of young stars that are gradually spreading apart and found inside our Milky Way galaxy, while globular clusters are ancient clusters of stars that are compact, billions of years old, bound to each other and orbit around our galaxy. Due to their considerable distance, globular clusters are usually only visible in telescopes, but one notable exception is M13, also known as the Great Cluster or Hercules Cluster. During very clear dark nights, skilled observers may be able to spot M13 without optical aid along the border of the Keystone, in between the stars Zeta and Eta Herculis - and a bit closer to Eta. Readily visible as a fuzzy “star” in binoculars, in telescopes M13 explodes with stars and can fill up an eyepiece view with its sparkling stars, measuring a little over half the diameter of a full Moon in appearance! When viewed through small telescopes, globular clusters can appear orblike and without discernable member stars, similar in appearance to the fuzzy comae of distant comets. That’s why comet hunters Edmund Halley and Charles Messier discovered and then cataloged M13, in 1714 and 1764 respectively, marking this faint fuzzy as a “not-comet” so as to avoid future confusion.

While enjoying your view of M13, don’t forget to also look for M92! This is another bright and bold globular cluster, and if M13 wasn’t so spectacular, M92 would be known as the top celestial sight in Hercules. M92 also lies on the edge of naked-eye visibility, but again, binoculars and especially a telescope are needed to really make it “pop.” Even though M92 and M13 appear fairly close together in the sky, in actuality they are rather far apart: M13’s distance is estimated at about 25,000 light years from Earth, and M92’s at approximately 27,000 light years distant. Since M13 and M92 appear so close together in our skies and relatively easy to spot, switching between these two clusters in your scope makes for excellent star-hopping practice. Can you observe any differences between these two ancient clusters of stars?

Globular clusters are closely studied by astronomers for hints about the formation of stars and galaxies. The clusters of Hercules have even been studied by NASA’s space telescopes to reveal the secrets of their dense cores of hundreds of thousands of stars. Find their latest observations of globular clusters - and the universe - at nasa.gov.



Composite image of the dense starry core of M92 imaged in multiple wavelengths. While your own views of these globular clusters won't be nearly as crisp and detailed, you might be able to count some of its member stars. How far into their dense cores can you count individual stars? Credits: ESA/Hubble & NASA; Acknowledgment: Gilles Chapdelaine. Source: <https://www.nasa.gov/feature/goddard/2017/messier-92>



Look up after sunset during summer months to find Hercules! Scan between Vega and Arcturus, near the distinct pattern of Corona Borealis. Once you find its stars, use binoculars or a telescope to hunt down the globular clusters M13 and M92. If you enjoy your views of these globular clusters, you're in luck - look for another great globular, M3, in the nearby constellation of Boötes. Image created with assistance from Stellarium: stellarium.org

Astrophotography (SIG)

Special Interest Group

Join Our Astrophotography Special Interest Group (SIG)
– Mike Jensen, Group Lead

REGULAR MEETINGS

Regular meetings are usually on the Third Tuesday of each month, HOWEVER The next meeting is Tuesday July 26th at 6:30 due to a conflict.

<https://us02web.zoom.us/j/81077794455?pwd=MHJVL2VvZGZKR3JyM-1d5QVjZlZE1TUT09>

Meeting ID: 810 7779 4455
Passcode: Phot@SIG

ABOUT THE ASTRO SIG

Every month we get together on a Zoom call with a pretty loose agenda and manage to have an absolute blast talking about Astrophotography. I hope you'll join us if you're interested in Astrophotography.

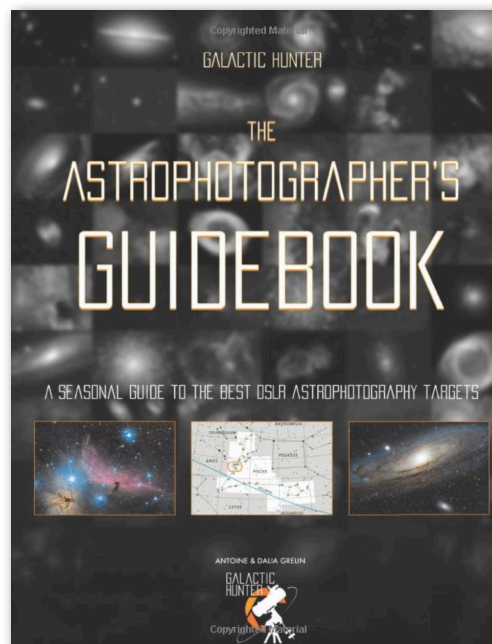
We have a nice, diverse group with a wide range of skill sets and interests. Some DSLR/Mirrorless shooters mixed in with telescope shooters. Some use Star Trackers, some use goto mounts, some use laptops and some use a fun little unit called the ASIAIR (a small little computer inside a box about the size of a cell phone that connects to a tablet or smart phone).

On any given day or moment we can shoot an email out to the group and get suggestions and answers, how cool is that?

Now, the REALLY cool thing is that it looks like the pandemic is FINALLY starting to ease off so that means we can finally start getting together and be safe! That means

more helping each other, more show and tell, more mentorship which is exactly why we created the Astro SIG.

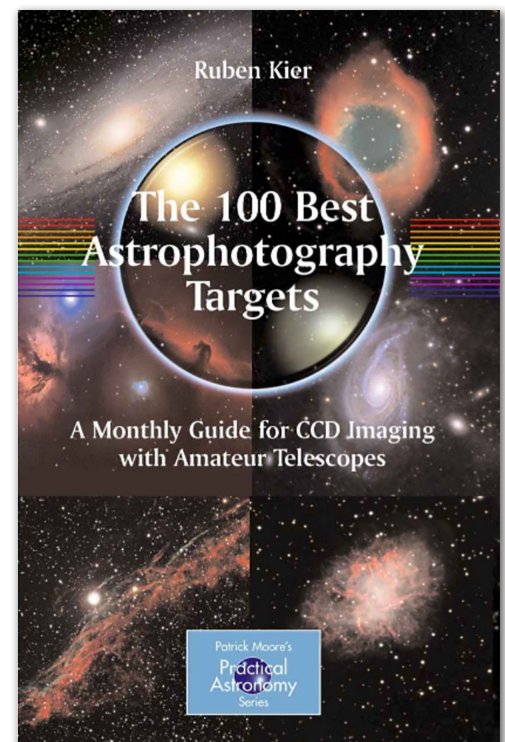
So, if you want to learn Astrophotography (like Astro 101) with a LOT of fun people, join us.



Discover 60 Deep Sky Objects that will considerably improve your Imaging and Processing skills! Whether you are a beginner, intermediate, or advanced astrophotographer, this detailed book of the best deep sky objects will serve as a personal guide for years to come!



Astro Photography Books



Any amateur astronomer who is interested in astrophotography, particularly if just getting started, needs to know what objects are best for imaging in each month of the year. These are not necessarily the same objects that are the most spectacular or intriguing visually.

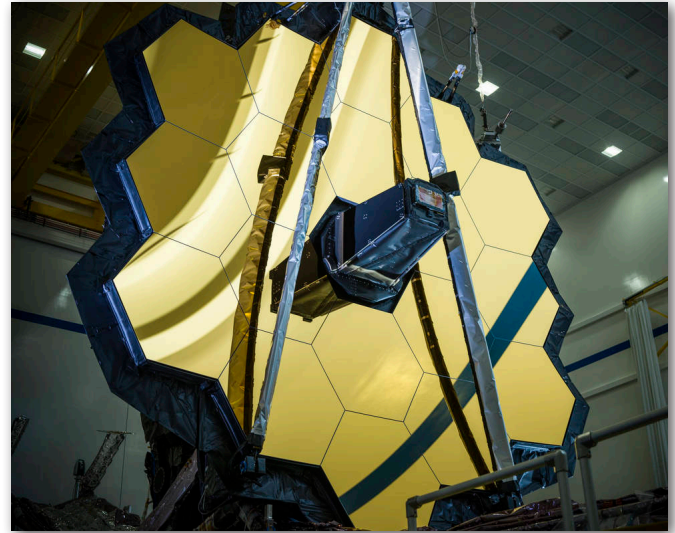
First Images From Webb Expected 7/12

We're almost ready to unveil the first full-color images from the James Webb Space Telescope. These images will demonstrate Webb at its full power, ready to begin its mission to [unfold the infrared universe](#).

The images will be released one-by-one during a televised broadcast beginning at 10:30 a.m. EDT on Tuesday, July 12, from NASA's Goddard Space Flight Center in Greenbelt, Maryland. Live coverage of the image release broadcast will air on NASA TV, the NASA app, and the [agency's website](#). The public also can watch live on Facebook, Twitter, YouTube, Twitch, and Daily Motion.

Additionally, Webb experts will answer questions about the first images and data in a NASA Science Live show on Wednesday, July 13, at 3 p.m. EDT. The broadcast, Webb's First Full-Color Images Explained, will air live on the [NASA Science Live website](#), as well as YouTube, Facebook, and Twitter. NASA will also broadcast a live social media event in Spanish on its NASA en español YouTube, Facebook, and Twitter accounts.

Webb, an international collaboration led by NASA with its partners the European Space Agency and the Canadian Space Agency, is the biggest telescope ever launched into space. It will unlock mysteries in our solar system, look beyond to distant worlds around other stars, and probe the mysterious structures and origins of our universe and our place in it.



Download a Webb First Images Virtual Packet from our website. Click the image to the left.

WEBB MISSION

Webb will study every phase of 13.5 billion years of cosmic history –from within our solar system to the most distant observable galaxies in the early universe, and everything in between.

Webb will seek light from the first galaxies in the early universe, and it will explore our own solar system, as well as nearby planets orbiting other stars. Themes highlighted in the first images and spectra include cutting-edge explorations of the early universe, the evolution of galaxies through time, the lifecycle of stars, and other worlds outside our solar system.

Webb will orbit the Sun at the second Lagrange point, called L2, which is located one million miles from Earth.

How To Use Stellarium

Compiled By Mike Jensen

Content source: <https://medium.com/wethecurious/how-do-i-use-stellarium-a-guide-to-the-basics-6d4485d70234>

Whether you're a newbie or a vet, Stellarium is a must have for all Astronomy enthusiasts. Stellarium is a free open source planetarium for your computer. It shows a realistic sky in 3D, just like what you see with the naked eye, binoculars or a telescope.

Head to stellarium.org. You'll find at the top of the page a series of operating system logos. You'll also see a link to download a Stellarium User Guide that will come in very handy if you want to take a deep dive into everything Stellarium's capable of. A VERY QUICK option is to go to <https://stellarium-web.org/> I use this option frequently, but only because I haven't taken the time to learn the desktop version.

Click on the operating system logo that applies to your computer and download the installation file. Once the file is downloaded, find it in your Downloads folder. Double click on it and follow the installation instructions.

Launching Stellarium

Once Stellarium is launched the first thing you'll see is a grassy landscape in front of you and the sky overhead. You'll find that you can **move yourself around by either left clicking and dragging your mouse or by using the arrow keys.**

Stellarium will show you the view



from whatever town or city you're currently physically located at by checking your network. You can however **change your location in Stellarium.**

Bring your cursor over to the left-hand side of the screen. A menu will appear with a number of tools. Choose the top option labeled Location Window.

You'll see drop down menu boxes that enable you to change the view and look at the sky from anywhere you want to in the world. You can even move yourself to another planet or moon!

Changing your location will not change the landscape, but you can do that by selecting the Sky and Viewing Options Window from the left-hand menu and clicking on the Landscape tab to choose from a selection of landscapes. When you're done with a window, click on the x in the top right-hand corner to get rid of it.

Time-travel

Below the **Location Window** on the left-hand menu is a **Date/Time Window**. Click on that and you'll be able to **change the date and time** to anything you want. You can look at the sky tonight or look at the sky on the night you were born. You can even view the sky thousands of years in the past or future!

Keyboard shortcuts

If you bring your mouse to the bottom of your screen, you'll find

another menu with a number of useful tools. Many of these tools can also be accessed via keyboard shortcuts, and personally I find these a lot easier to use. Here is a list of some of the shortcuts I've found myself using the most.

- Left click: Select any object in the sky — a star, a planet, or a satellite.
- Right click: When you want to move on from your selected object, simply clear your selection.
- Space Bar: Get whatever you've selected into the centre of the screen.
- Page Up: Get a closer look at whatever you've selected by zooming in.
- Page Down: Zoom out.
- Alt + S: Some of the more notable stars are automatically labelled but you can turn those labels off and on again.
- Alt + P: Planets are automatically labelled but you can turn those labels off and on again.
- Ctrl + Shift + M: Meteor showers are automatically highlighted with green marks but you can turn these off and on again.
- G: If the landscape is spoiling your view, turn it off. Pressing G again will turn it back on.
- F: There's a hazy fog above the landscape that's particularly noticeable at night. If you want to recreate a completely clear night you can turn it off. Pressing F again will turn it back on.
- Q: Turn the red compass labels on and off
- A: If you'd like a completely unobstructed view of the stars you



can even turn off Earth's atmosphere. This is particularly handy if you'd like to see the position of the stars during the daytime. Pressing A again will turn it back on.

- M: The Milky Way is beautiful path of dense stars stretching across the sky. It's our view of the disk of our home galaxy from within. It isn't visible from most cities and towns due to light pollution. If you want to try and recreate this experience, turn off the Milky Way. Pressing M again will turn it back on.
- Alt + Shift + Z: Just like the real sky, you'll occasionally see little dots move across the sky. These are satellites orbiting the Earth. They're used for a number of purposes, including communication and defence. You can left click on it to find out it's name, or you can press Alt+Shift+Z to label every satellite. Press Alt+Shift+Z again to make the labels vanish.
- C: If you're having trouble making out all the constellations you can turn on the constellation lines. Pressing C again will turn them off.
- V: This button will make labels for every constellation appear. Press it again to make them vanish.
- R: View constellation artwork by Johan Meuris and press the button again to make the artwork vanish.

Screenshots of the various menus and panels of Stellarium on pages 12-14

Location
✕



- 'Afak, Western Asia
- 'Ain Abid, Northern Africa
- 'Ain Benian, Northern Africa
- 'Ain Deheb, Northern Africa
- 'Ain Merane, Northern Africa
- 'Ain el Bell, Northern Africa
- 'Ain el Berd, Northern Africa
- 'Ain el Hammam, Northern Africa
- 'Ain el Melh, Northern Africa
- 'Ain el Turk, Northern Africa
- 'Ajlun, Western Asia

Current location information

Latitude:	<input type="text" value="N 27° 0' 26.64"/>	Name/City:	<input type="text" value="Punta Gorda"/>
Longitude:	<input type="text" value="W 82° 0' 58.67"/>	Region:	<input type="text" value="Northern America"/>
Elevation:	<input type="text" value="0 m"/>	Planet:	<input type="text" value="Earth"/>
<input type="button" value="Get location from GPS"/>		Time zone:	<input type="text" value="America/New_York"/>

Get location from Network
 Use current location as default

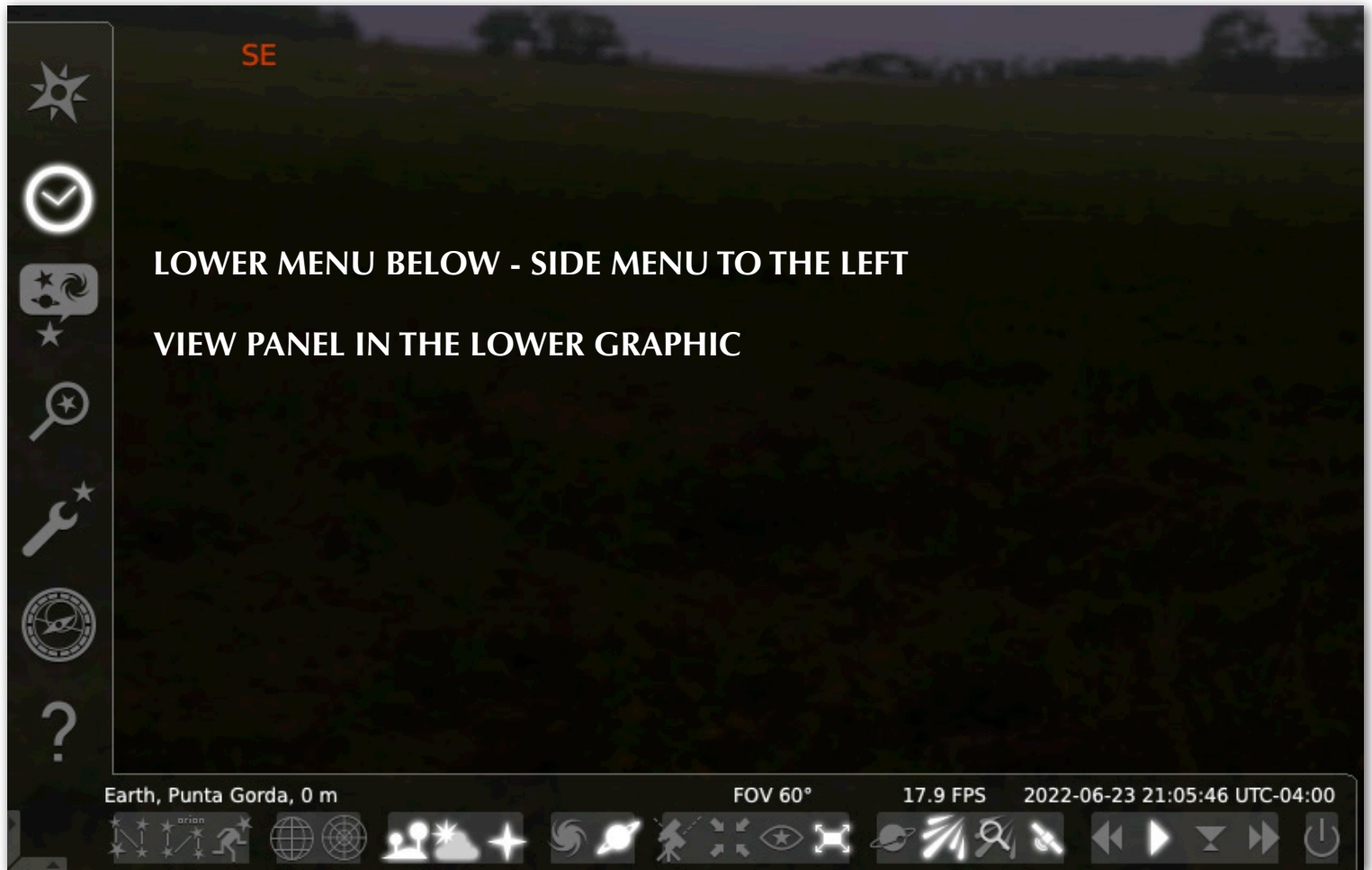
Use custom time zone
 Enable daylight saving time

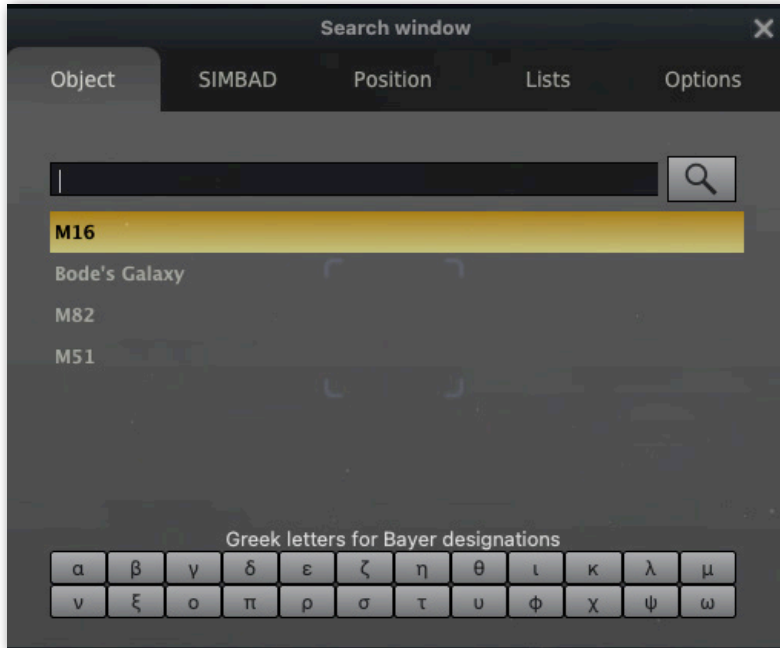
LOCATION WINDOW ABOVE - TIME TRAVEL WINDOW BELOW

Date and Time
✕

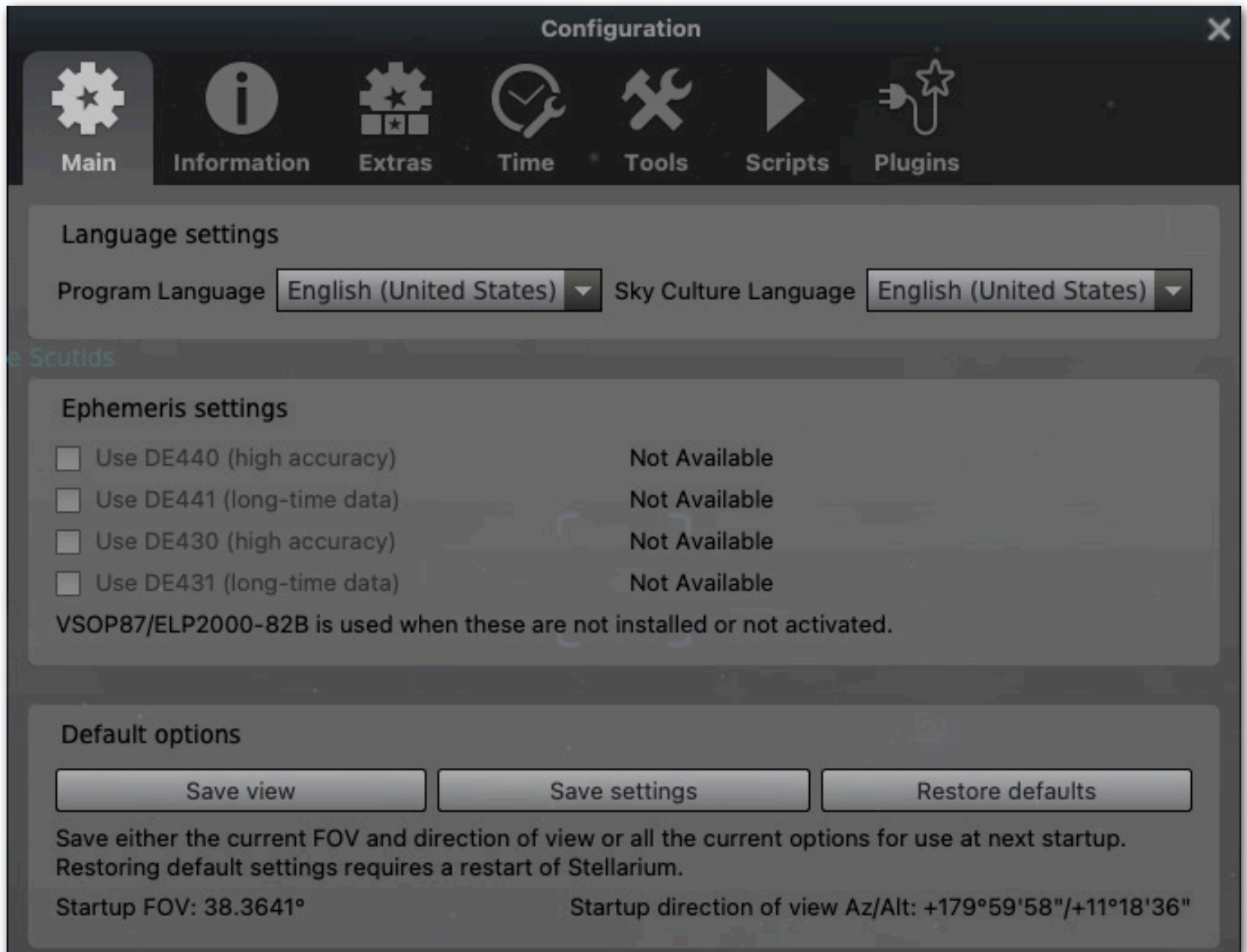
Date and Time

Julian Day

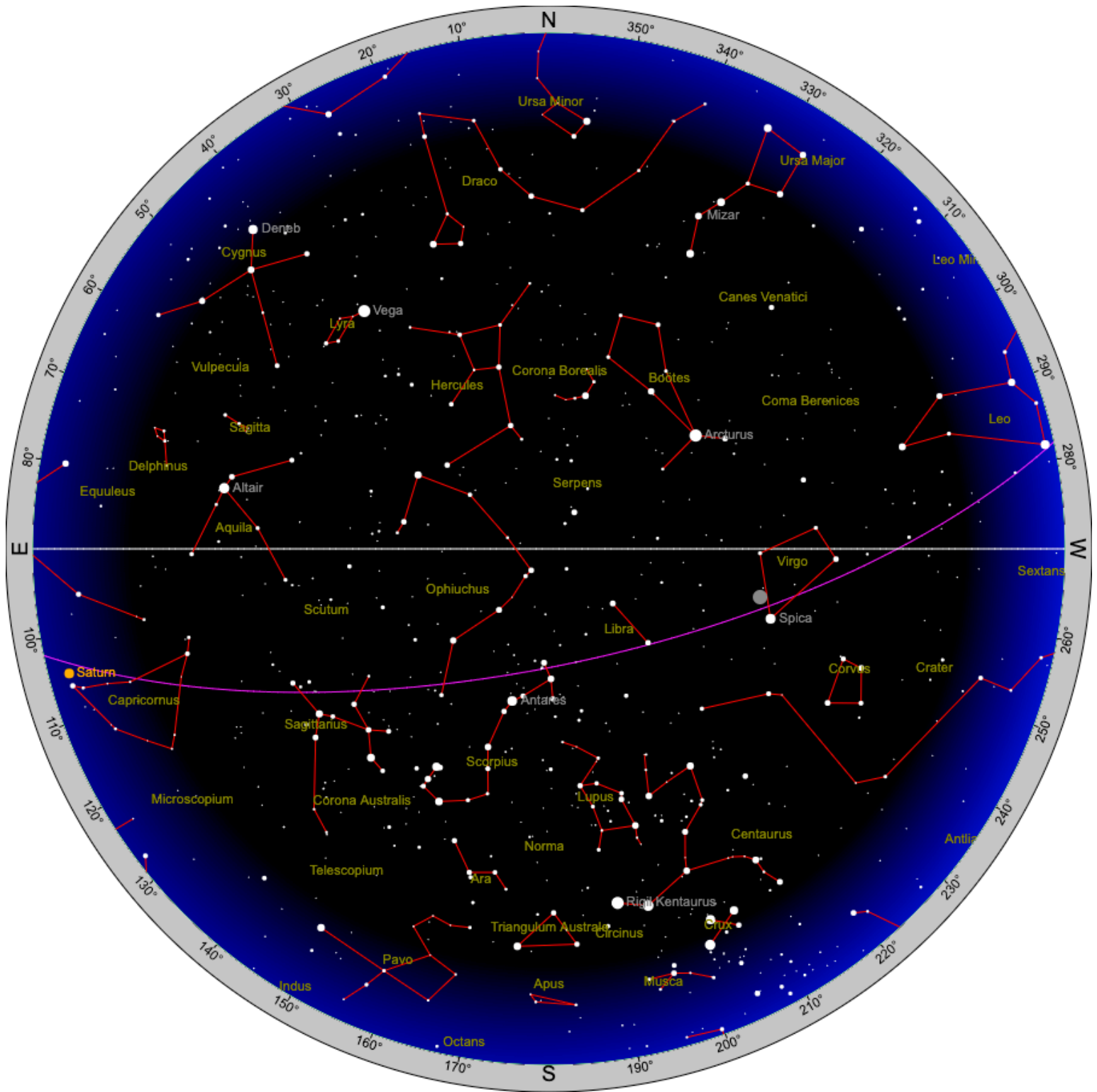




SEARCH PANEL TO THE LEFT
 CONFIGURATION PANEL BELOW

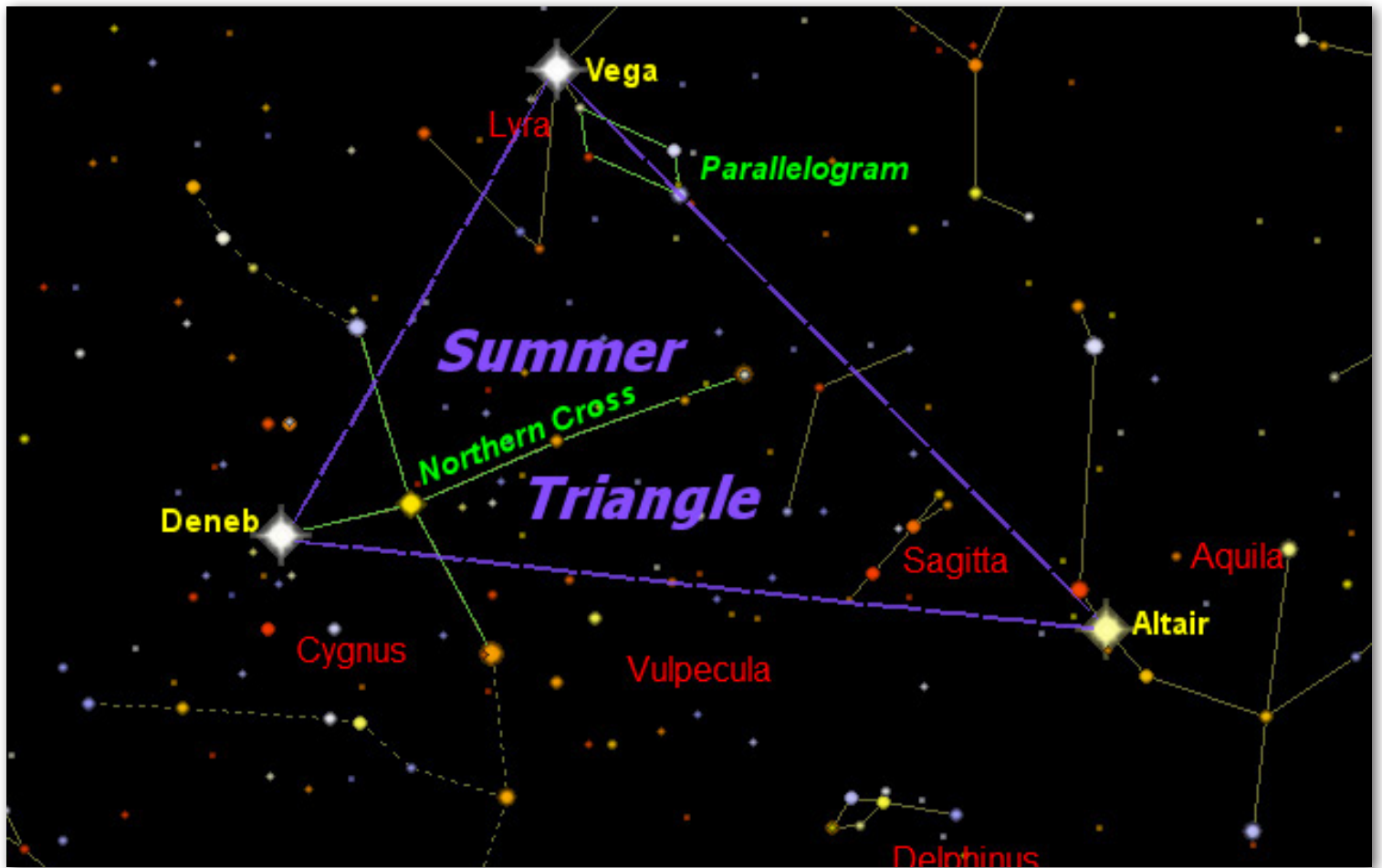
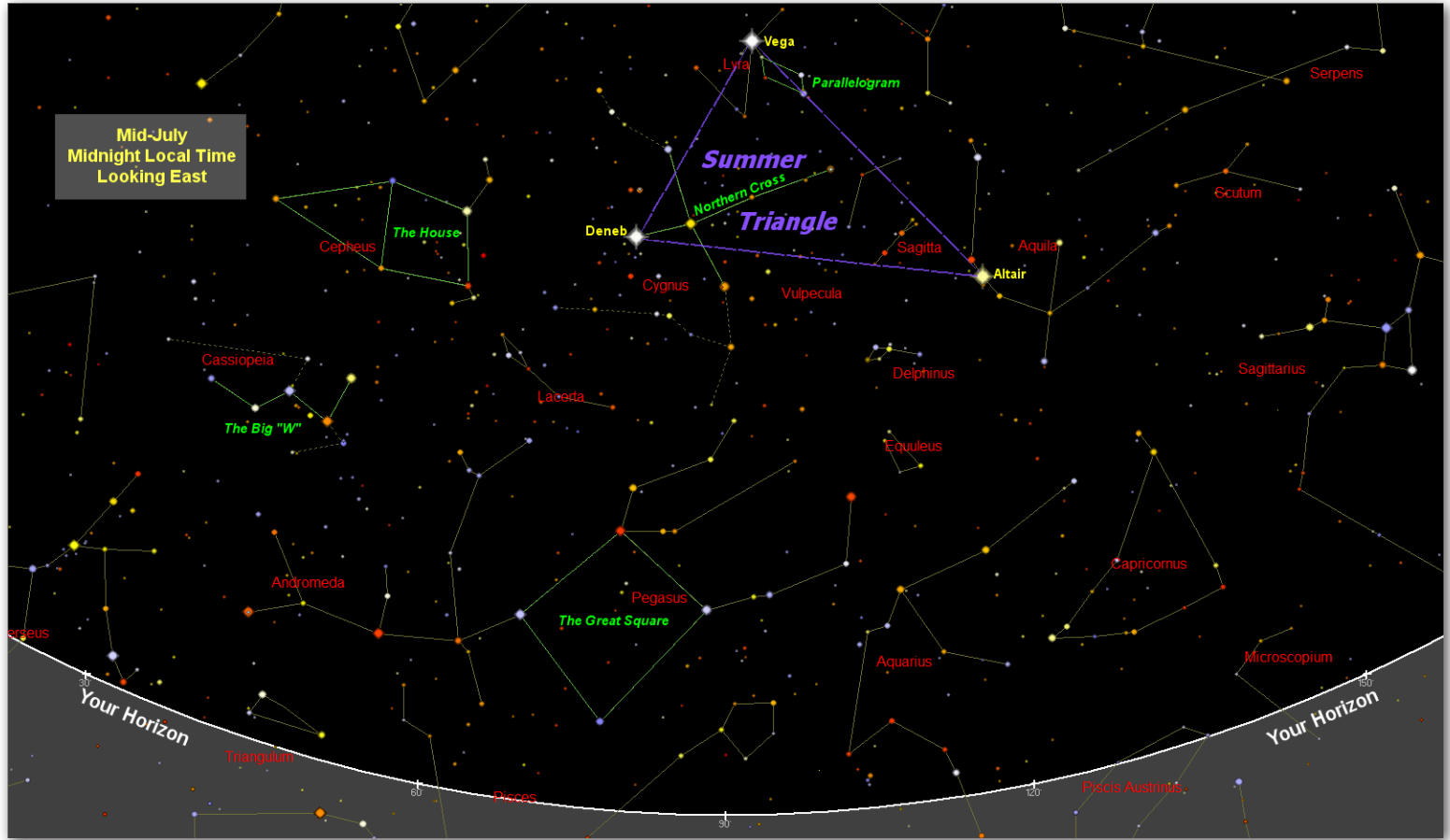


July 2022 Sky Chart



You can download or view this map better at: <https://heavens-above.com/skychart2.aspx?lat=0&lng=0&loc=Unspecified&alt=0&tz=UCT>

To download (or view better) the map of the Summer Triangle, go to this link: https://www.almanac.com/sites/default/files/skymap_july1.pdf



Editorial Comment

By Mike Jensen, Editor



In the June

meeting our President Brian Risley conveyed a comment from one of our new members that struck

a chord with me. The comment was of the essence that the articles in the newsletter were a bit “technical” in content. We had a good discussion about it, and I’ve talked to several other members about it.

Here are some of my thoughts: Astronomy is Science at its most basic. That being said, there’s not much “basic” about the science of astronomy.

When I first joined this club (in November of 2020) I did so with the intention of learning more about astronomy (a lifelong interest) and with the hope of connecting with other astrophotographers. One of the first things I did was take a basic astronomy course offered by Richard Bell, a

professor at Western Michigan, and President of the Kalamazoo, Michigan astronomy club. It was a five session class complete with an “Amateur Astronomer” certificate! He gives this class at least once, maybe twice a year. I then took his college level class, an eight week in-depth look at our solar system and beyond. Both of these classes gave me a “conversational” understanding of astronomy. My learning is still a work in progress.

So, given that, I realize that there may be many of you out there like me. You want a basic understand of astronomy, but don’t really want a Phd in Physics. I read a HUGE amount of articles and web pages on astronomy each month as I research what to include in the newsletter. So, as I go through my monthly research, I will now include looking for some beginners or novice articles to include in the newsletter as well as link on the website. This month I will start with the **Meet The Stars of Summer** on the next page. Also, I should mention that our Astronomical League representative sent me three good resourc-

es from the AL. Here’s the links:

- [10 or Under: Sky Puppies](#)
- [10-17 Youth](#)
- [Adult Novice](#)



Also, there are LOADS of resources online to help you learn astronomy. I’m a big fan of asking people to own up to their own learning needs rather than being spoon fed by someone else but that being said, as the editor of the newsletter for a major astronomy club I feel it’s also my responsibility to provide some resources as well. So, please watch for the “Newbie Info” icon (above) to help you with your learning.

So, watch the newsletter and the new website when I get it up and running.

THINKING TELESCOPE? START STARGAZING WITH BINOCULARS INSTEAD

Binoculars make an ideal “first telescope” for several reasons:

- Binoculars show you a wide field of view, making it easy to find your way around. A higher-power telescope magnifies only a tiny, hard-to-locate bit of sky.
- They also show a view that’s right-side up and straight in front of you, making it easy to see where you’re pointing. An astronomical telescope’s view, by contrast, is often upside down, is sometimes mirror-imaged as well, and is usually presented at right angles to the direction you’re aiming.
- Binoculars are also relatively cheap, widely available, and a breeze to carry and store.



The performance of binoculars is surprisingly respectable. Ordinary 7- to 10-power binoculars improve on the naked-eye view about as much as a good amateur telescope improves on the binoculars — for much less than half the price.

For astronomy, the larger the front lenses the better. High optical quality is also important, more so than for binoculars that are used on daytime scenes.

For Newbies & Novices: Meet The Stars of Summer

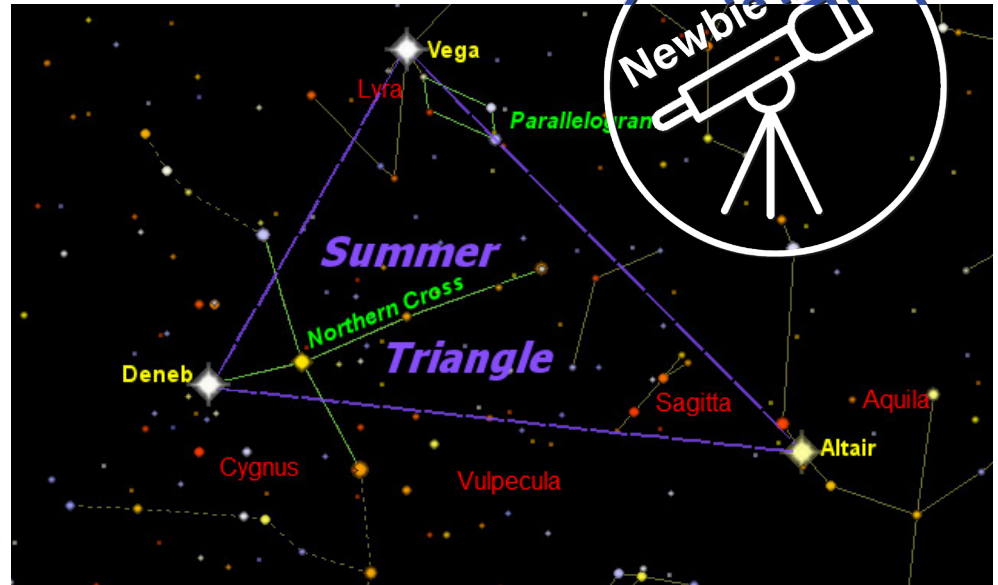
Year after year, century after century, star gazers have celebrated the return of the Summer Triangle. At this time every year, the distinctive three-cornered pattern formed by the bright stars Vega, Altair, and Deneb, is prominent in the southern sky.

Meet the Stars of Summer

The three stars of the Summer Triangle appear similar in brightness. Vega in the constellation Lyra the Lyre is the brightest of the trio and the 5th brightest of all stars. In Carl Sagan's novel "Contact," Vega is the source of the first message ever received from an alien civilization. The 1997 movie version features actress Jodie Foster's quest for the senders of the Vega message. Back in the real world, we've yet to hear anything from the possible inhabitants of the Vega system, but researchers are listening to Vega and thousands of other stars every day, just in case.

Altair, in Aquila the Eagle, is another Hollywood star. In the 1956 film "Forbidden Planet," the fourth planet in the Altair system (Altair IV) is home to the relics of an ancient alien civilization and to an eccentric Earth scientist and his beautiful daughter (Walter Pidgeon and Anne Francis). Altair is the 2nd brightest member of the Summer Triangle and 13th brightest star of all. We don't know if Altair is surrounded by any planets, so Altair IV may or may not exist.

Number three in the Summer Triangle and 20th brightest star is Deneb, which marks the tail of Cygnus the Swan. Alas, Deneb has



never starred in a major motion picture, but it has other claims to fame. Whereas Vega and Altair are relatively close to us in astronomical terms—25 and 17 light-years respectively—Deneb is much farther away, an estimated 2,600 light-years from Earth. A light-year is the distance light travels in one year—a big, BIG number!

Apparent Brightness

The three stars of the Summer Triangle appear to be about equal in brightness. Put another way, their "apparent brightness" is roughly the same. But looks can be deceiving! We know that Deneb is more than 100 times farther from us than Vega or Altair, yet it appears nearly as bright. How can this be? The only way Deneb can both be farther away yet appear equal in brightness is if its actual (or "intrinsic brightness") is much greater than the others. In fact, Deneb is one of the most luminous of all stars—an astounding 200,000 times brighter than our Sun! The light we see from Deneb left the star about the time the Pyramids of

Egypt were being built.

Using the Summer Triangle

Once you've spotted the Summer Triangle, you can use it to find other sights. The largest and most prominent asterism (unofficial star pattern) associated with the Triangle is the Northern Cross, comprised of the brightest stars in Cygnus. Smaller and less prominent, but quite striking, is the exquisite little Parallelogram which hangs just below blazing Vega in Lyra. Sagitta the Arrow is a dim but delightful constellation that sits at the upper left of Altair. It's one of the smallest constellations, and it really does look like a little arrow! Just below Sagitta and similar in size is tiny Delphinus the Dolphin.

Elsewhere on this month's map, you'll find other asterisms of note, including the constellation Cepheus, shaped like a house, and Cassiopeia, which looks like a big "W." And if your horizon is free of trees and houses, you may glimpse the Great Square, the body of Pegasus the Flying Horse.

Planet Positions

Click on the graphic above to go to Time and Date for a great simulation of the rotation of the constellations and the rising/setting of the planets. The chart below is set for April 7th but can be programmed for any date and time. The chart can also be found at [this link on Heavens Above](#).

Planet Summary

Year Month Day Time

	Mercury	Venus	Mars	Jupiter	Saturn	Uranus	Neptune	Pluto
Right ascension	6 ^h 21 ^m 48.6 ^s	5 ^h 6 ^m 1.5 ^s	2 ^h 0 ^m 6.5 ^s	0 ^h 30 ^m 22.2 ^s	21 ^h 47 ^m 15.7 ^s	3 ^h 1 ^m 23.1 ^s	23 ^h 43 ^m 54.8 ^s	19 ^h 59 ^m 20.6 ^s
Declination	23° 39' 6"	21° 44' 53"	10° 18' 58"	1° 50' 5"	-14° 38' 46"	16° 45' 46"	-3° 2' 9"	-22° 45' 54"
Range (AU)	1.249	1.442	1.261	4.722	9.064	20.220	29.548	33.564
Elongation from Sun	10.5°	28.0°	73.9°	97.8°	141.4°	57.8°	110.3°	167.9°
Brightness	-1.3	-3.8	0.4	-2.3	0.5	5.8	7.9	14.3
Equatorial Diameter	5.39"	11.57"	7.43"	41.75"	18.34"	3.49"	2.31"	0.10"
Phase Angle	36.5°	41.2°	44.9°	11.7°	3.7°	2.5°	1.8°	0.4°
Constellation	Gemini	Taurus	Pisces	Cetus	Capricornus	Aries	Pisces	Sagittarius
Meridian transit	11:16	10:02	06:58	05:30	02:47	08:00	04:43	00:59
Rises	05:15	04:02	00:58	23:27	20:44	02:01	22:40	18:56
Sets	17:18	16:02	12:57	11:29	08:46	13:59	10:42	06:58
Altitude	-58.0°	-68.0°	-45.8°	-24.4°	15.8°	-57.8°	-12.8°	39.3°
Azimuth	319.2°	351.8°	75.1°	88.0°	105.2°	57.2°	93.1°	120.0°
Inferior Conjunction	2022-May-21 2022-Sep-23	2022-Jan-09 2023-Aug-13	-	-	-	-	-	-
Opposition	-	-	2020-Oct-13 2022-Dec-08	2021-Aug-20 2022-Sep-26	2021-Aug-02 2022-Aug-14	2021-Nov-04 2022-Nov-09	2021-Sep-14 2022-Sep-16	2021-Jul-17 2022-Jul-20
Superior Conjunction	2022-Apr-02 2022-Jul-16	2021-Mar-26 2022-Oct-22	2021-Oct-08 2023-Nov-18	2022-Mar-05 2023-Apr-11	2022-Feb-04 2023-Feb-16	2022-May-05 2023-May-09	2022-Mar-13 2023-Mar-15	2022-Jan-16 2023-Jan-18
Max. eastern elongation	2022-Apr-29 2022-Aug-27	2021-Oct-29 2023-Jun-04	-	-	-	-	-	-
Max. western elongation	2022-Jun-16 2022-Oct-08	2022-Mar-20 2023-Oct-23	-	-	-	-	-	-
Perihelion	2022-Apr-13 2022-Jul-10	2022-Jan-23 2022-Sep-04	2022-Jun-21 2024-May-08	2011-Mar-17 2023-Jan-20	2003-Jul-26 2032-Nov-28	1966-May-22 2050-Aug-17	1876-Aug-26 2042-Sep-03	1989-Sep-05 2237-Sep-15
Aphelion	2022-May-27 2022-Aug-23	2022-May-15 2022-Dec-26	2021-Jul-13 2023-May-30	2017-Feb-17 2028-Dec-28	2018-Apr-17 2047-Jul-15	2009-Feb-27 2092-Nov-23	1959-Jul-17 2125-Dec-01	1866-Jun-04 2114-Feb-19

NEWBIE AND BEGINNER FACTS

The sky is vast and distances between objects can be very large

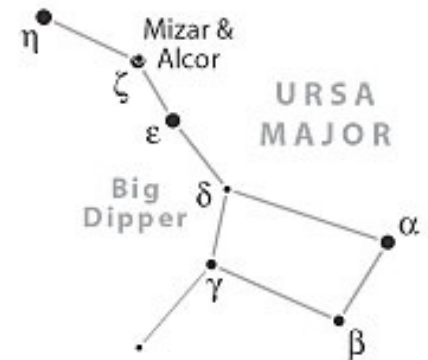
To the naked eye, the stars look like tiny points of light. But stars are not tiny—they're huge, burning balls of gas, like our Sun. They just appear small because they are so far away. The nearest star to our solar system is 4 light years away, which is 20 trillion miles. The stars may all look the same distance away, as if they were pasted on the wall of a giant dome. But that's an illusion too. Some stars are tens of thousands of light years farther away from Earth than others. Look at the image on the next page.



ASTRONOMY FOR BEGINNERS: HOW TO GET STARTED IN BACKYARD ASTRONOMY

Source: <https://skyandtelescope.org/astronomy-resources/stargazing-basics/how-to-start-right-in-astronomy/>

Did you know you can see a galaxy 2½ million light-years away with your unaided eyes? Craters on the Moon with binoculars? Countless wonders await you any clear night. The first step in astronomy for beginners is simply to look up and ask, "What's that?" Begin gazing at the stars from your backyard, and you'll be taking the first step toward a lifetime of cosmic exploration and enjoyment.



But what, exactly, comes next? Too many newcomers to astronomy get lost in dead ends and quit in frustration. Astronomy for beginners shouldn't be that way.

What advice would help beginners the most? A while ago, the *Sky & Telescope* editors got together to brainstorm this question about astronomy for beginners. Pooling thoughts from more than 100 years

of collective experience answering the phones and mail, we came up with the following pointers to help newcomers past the most common pitfalls and onto the likeliest route to success.

LEARN THE NIGHT SKY WITH THE UNAIDED EYE

Astronomy is an outdoor nature hobby, so the best way to begin is to go out into the night and learn the starry names and patterns over-

head.

- Use the monthly naked-eye star charts posted here, or in [Sky & Telescope magazine](#)
- Download their free [Getting Started in Astronomy flyer](#) (with bimonthly maps)
- Buy yourself an inexpensive [planisphere](#), which shows the constellations visible at any time throughout the year.

