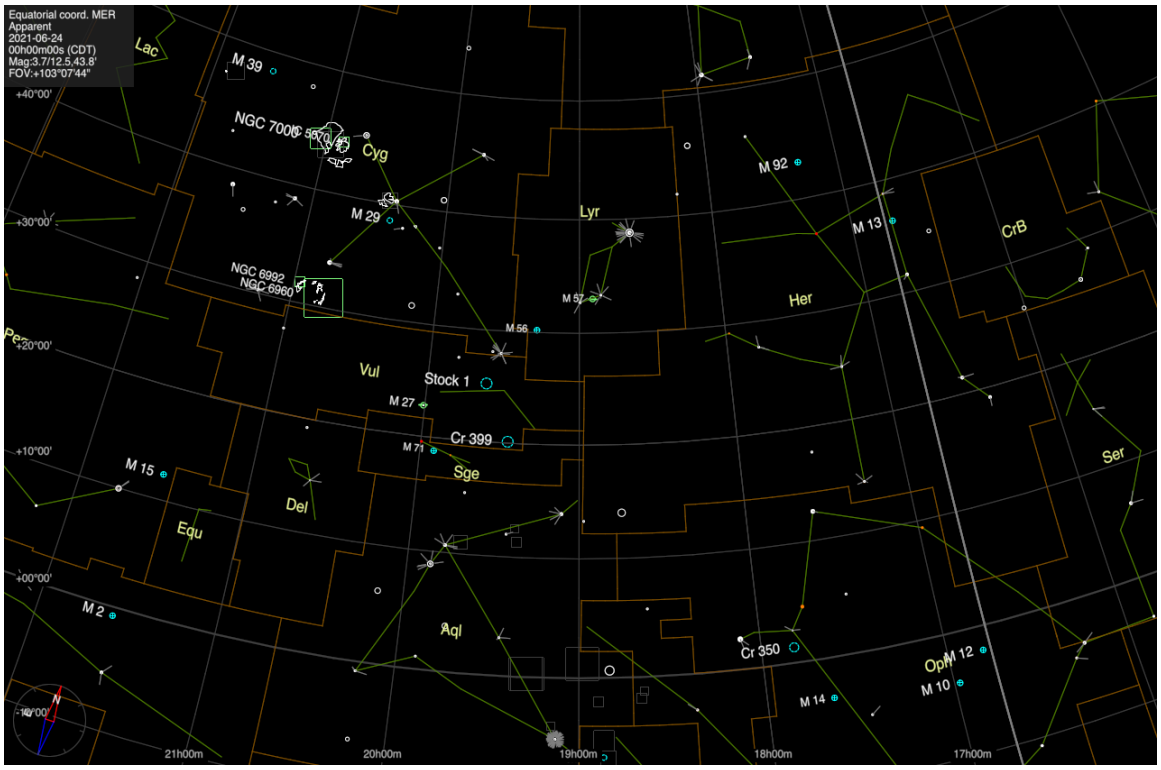
Lloyd Lashbrook is inviting you to a scheduled Zoom meeting. TAS/ObSIG
September 8, 2021 – 7:00PM – 9:00PM CDT

Agenda

- **Greeting and opening discussion**
- **Wazup with Chaz**
- **New set of Observing programs – John Wagoner**
- **Observing Notes and learning the Triangle**

Inside the Triangle



- Vega, Altair and Deneb compose the summer triangle.
  - Vega is the alpha star in Lyra
    - 5th brightest star in the sky
    - close at 25 lys away
    - 37 times the sun's luminosity, 2.3 solar masses and spins so fast it is slightly misshapen
  - Altair is the alpha star of Aquila being both a variable and multiple system of four stars (a,b,c&d)
    - 13th brightest star in the sky
    - very close at 16.8 lys away
    - 10.6 times the luminosity of the sun, 1.7 solar masses and rotates so fast that it bulges at the equator.
  - Deneb Cygni is the alpha star of Cygnus
    - 19th brightest star in the sky
    - very far away, the distance is not well known but is believed to be 1,400 to 2,600 lys Deneb Cygni is a true monster star.
    - Luminosity could be 200,000 times that of the sun while the solar diameter would be 200 times that of the sun and the 19 solar masses indicate it will explode in a super nova at the end of it's life.

Now that we know the summer triangle stars and how to find them, let's look at some of the great objects associated with them.

- Epsilon Lyrae, also known as the double- double are a pair 5.8 and 5.2 magnitude stars that will split a second time into a total of four stars.
  - This star can usually split into these four stars with any amateur scope that can reach 100x easily. How many stars can you count?
  - It is easily found 1 ½ ˚ to the 10:00 of Vega

- M57 in Lyra - is the famous Ring Nebula. And yes, it really does look like a little smoke ring floating in space.
  - Location 18h54' / DE+33˚04'
  - Great view at 94x with the 6". It appears as a an oval torus with some detail. You can't see the off center white dwarf star unless you have a huge scope that would give extreme powers.
  - Specs, 8.4 magnitude with a surface brightness of 9.3. Size is1.4' x 1.1' and the distance is 1,400 lys.
  - To find the ring, go to the bottom of the parallelogram asterism and center Beta Lyrae. M57 will not show up in your finder but with1˚ of true field and more than 30x, it will appear near the far edge at 9:00.

Now let's go to Cygnus the swan or some call it the northern cross. You could spend two or three observing sessions in Cygnus alone but for tonight let's just observe a couple of basics.

- M29 the water tower, really? So say some, but I never could see that in this Cygnus open cluster.
  - Location 20h24' / +38˚32'
  - Specs, 6.9 magnitude with a surface brightness of 11.0, and a size of 10' and lies 5,000 lys distant.
  - Shows eight stars in a distinct facing double arc pattern at 60x. Jump to 90 or 100x, if you can, to see some of 20 or so fainter stars. However, be aware that they are difficult to distinguish from the Milky Way background stars.
  - To find M29, start at Sadar, which is the middle of the swan. Move two full fields to the SE (8:00) and M29 should be in a 1˚ field eyepiece.

- Beautiful Albireo, Beta Cygni
  - Two stars well separated by 35" at magnitudes of 3.1 and 4.7
  - Brilliant gold and azure blue. Stunning! Always a favorite of the Public Star Party crowds.
  - Look to the base of the cross to see Albireo.

Still inside the triangle. Aquila does not offer much if you have a small scope but I will include two nice Aquila planetary nebulae in the Advanced Observing notes. However, between Albireo and Altair there are two small constellations that are worth exploring. Vulpecula, which lies below to the star Albireo and Sagitta, which lies above Aguila. Let's

explore these two now.

- M27 in Vulpecula – Didn't we already see something like this?
  - Location 19h59' /+22˚43'
  - Yes! Let's compare. M27 is another planetary nebula like the Ring but it looks very different. Why? Let's use an 0III filter here to get the best view.
  - Specs, 7.1 magnitude with a surface brightness of 11.2 and 8' x 5.7' in size. Larger isn't it? The distance to M27 is not well established but is commonly given as 1,200 lys. If this is so, both M57 and M27 are close to the same distance. That must mean the true size of M27 should be much larger.
  - I see an apple core shape with this planetary in the six inch at 60x with my filter. If you take off the filter and increase power it is quite large in the field but will give no more detail. Why are M27 and M57 so different in shape??
  - To find M27 you need clear dark skies. In such skies, the boomerang shape of Vulpecula can be seen clearly. Look at 13 Vulpecula at the eastern end of the asterism. Place Vul 13 to the 2:00 position. M27 should be near the center of a 1˚ field.

- Cr399 in Vulpecula – Hang up that coat! …with binoculars??
  - Yes! Use binoculars here. This object, Collinder 399, is known as the coat hanger and is a true asterism.
  - Location 19h25' / +20˚11'
  - Specs, 3.6 magnitude with no surface brightness given, 1 ¼ ˚ in size and is at a distance of 4.200 lys.
  - One can find this object easily with 10x50 binos. Start at the middle star of the boomerang (Anser). Put the star at the 12:00 and Cr399 will show up near the 5:00. If you have a very wide field eyepiece you can try this one in a scope. Or try a pair of larger binoculars. Actually, Cr399 looks very good in a 9x50 finder scope.
  - Some call this object an open cluster, but if you study the stars of this asterism, you will find the distances very wildly. So I don't think so.

- M71 the loosey goosey globular in Sagitta
  - Location 19h54' / +18˚46'
  - Specs, Magnitude 8.2 and a surface brightness of 12.0, size – 7', distance of 13,000 lys
  - Perhaps the loosest globular known, it has been debated whether this object is really an open or globular cluster.
  - At 93x this object does not quite resolve in my 6" scope but looks great in an 8" scope at the same power.
  - To find M71 first find the small arrow below Vulpecula and above Aquila. M71 lies half way and just off the line between Delta (the base of the fletch of the arrow) and Gamma (the tip of the arrow).

Advanced Observing Close to the Triangle

- NGC7000 - Great to see home like this.
  - The North American Nebula requires at least a 10' scope and excellent skies.

- Specs, Magnitude is 4.0, the surface brightness not given but must be around 14th magnitude, size is 2˚x1/2˚ and it lies 2,600 lys distant. This huge object has such a low surface brightness due to its' large size.
- To find NGC700 look 3˚ toward 8:30 from Deneb.

❖ NGC6960 - A thinly veiled object
- Location RA 20h46'
- Specs, Magnitude 5, surface brightness again is not given, size is 3 ½˚ by 2 ½ ˚ it lies 2,600 lys distant
- Actually there are four nebula here. NGC 6960, 6974, 6979 and 6995. Some of them even dimmer than dim. How many can you see?
- To start your hunt for these ethereal objects look a little over 3˚ south of Epsilon Cygni.

❖ NGC6826 / a clear-cut case for AV. The blinking planetary.
- Location 19h45' / +50˚33'
- Specs 8.9 magnitude, surface brightness 6.9 and 27" in size and 4,000 lys distant.
- You must use averted vision with this object since it will disappear if you look at it directly
- To find this blinker look 1 1/2˚ to the 10:00 of Theta Cygni.
- This object can be seen with small scopes but it is a little hard to find.

❖ NGC6781 Large dim planetary in Aquila
- Location 19h19' / +06˚32'
- Magnitude 11.8, surface brightness 12.8, it is 2' in size and lies 5,000 lys distant.
- He's large but he very dim. Lots of luck.
- To find it look 4˚ to the 1:00 of Delta Aquilae

❖ NGC6790 Small but bright planetary in Aquila
- Location 19h23' / +01˚31'
- Specs 10.7 magnitude, surface brightness 5.9 magnitude, size 12" and 4,200 lys distant.
- To find look just under 2˚ to the 5:00 of Delta Aquilae.
- This another good target for small scopes.