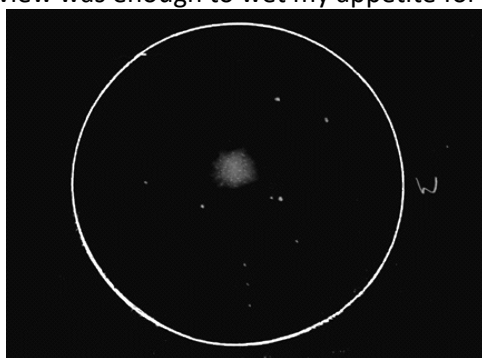


Observing NGC5139 – Omega Centauri

As a mid-latitude northern hemisphere visual observer going back to 1980's, one of the visual 'bucket-list' deep-sky objects that everyone chased was the great globular cluster "Omega Centauri", also known as NGC5139. For us, only the northern most stars of the constellation of Centaurus barely crest the horizon. Unless one traveled south, viewing Omega was mostly just a daydream that one could only read about in the magazines.

Over the years, I did get a few chances to visually observe NGC5139, once in the late 80's in May in the eastern outskirts of Louisville Kentucky from a ridge in a park with a 38 deg latitude using a home built 10" f5.6 dob. The cluster was a large unresolved oval glow, filling the low-power eyepiece FOV, which quickly passed thru a tiny cleft in the hills, not enough time to really view it using higher magnifications. I wasn't able to get back to that park until a year later only to find that trees had grown into the cleft blocking any further attempts to view the cluster.

In 2012, I was more successful on a late May vacation trip to Anna Marie Island (27.5 deg) off the Gulf of Mexico coast in Florida. Unfortunately, the only optical equipment that I had with me was a pair of 8x60 binoculars. Even with that, I had to wait till well after midnight for Omega to clear the hotel lights along the beach before I could observe and sketch it as it was setting into the gulf. The view was enough to wet my appetite for more.



(Pencil sketch using 8x60 binoculars).

Fast-forward a few years to my 3rd chance for Omega, late April on an 1100 ft in elevation ridge from Calhoun County Dark-Sky Park in West Virginia at latitude of 38.5 degrees. It was Wednesday, April 27th, 2022, close to midnight. Using my 8" SCT optical tube mounted on a German equatorial, I slewed the telescope southwards towards the horizon where the stars of Centaurus were hovering over the nearby tree tops. I then moved the telescope further south to the lower position of Omega Centauri. Talk about low-elevation observing! NGC5139 had an elevation of just shy of 3.5 degrees above the horizon! But once again, it was literally thru the tree branches. Using the wide-field Canon lens set to 100mm, I could see the large diffuse glow of the cluster shining thru and around the limbs. I walked over to the telescope and sighted down the nearly horizontal tube to see where I was pointing. I quickly realized that the globular was never going to actually clear the tree tops. But it was nearing a thinner section of limbs where I had a chance to get in an observation. Within a few minutes NGC5139 moved into a slight gap in the branches and I quickly made an EAA observation with the main camera on the 8" SCT. Soon afterwards the cluster dived back into the thicker branches and was lost to view. The timing was really good for making this observation thru the trees, as the foliage was noticeably thicker a few days later as warm weather really brought out the budding leaves.



(single 5 second snapshot using my Canon-100mm CCTV lens & ASI290MC camera)

(8" SCT @ f6.3 on an Atlas Gem, ZWO ASI294MC camera with L-Pro filter, 20 second subs, not guided, livestacked using Sharpcap for 80 seconds).

With having to use a very short exposure time, I was able to EAA observe the dark feature called the "Eye of Omega", which is possibly a dark molecular cloud that is in front of the cluster in our line-of-sight. (Cloudy Nights, 2024, 6), This is generally only seen visually, as most images are longer exposures to pull-out more of the fainter cluster stars, and tend to cause the "Eye" to blend in. (To me the feature kind of resembles the face of a skull). While not a 'pretty picture', I had definitely completed an EAA challenge observation, capturing the globular cluster NGC5139 - "Omega Centauri". Still, I knew I could do better at Calhoun, from the new observing field that was being built.

The following year in late April, 2023, I was once again back at Calhoun for my 4th attempt at Omega. Now on the new observing field with a clear horizon sight-line into the Appalachian Mountains, the clock was just past midnight, the 'witching hour' of Centaurus collimating on the meridian was fast approaching. It was time to prepare for the highlight of the trip, EAA observing the great globular cluster Omega Centauri!

After first settling on a nearby bright 2nd magnitude star "Menkent" (Theta Centauri) to check the camera focus, I then slewed the telescope further south, nearly horizontal, to the position of Omega Centauri, NGC5139, which was approaching the meridian at its maximum elevation of about 3.44 degrees. After a 15 second sub frame exposure, the globular cluster filled the center of the laptop display, with streamers of stars extending towards the edges of the field. Quite a sight! According to info in the 'Annals of the Deep Sky', a number of Omega's astrophysical characteristics points to the possibility that the 'cluster' is actually the remnant nucleus of a dwarf galaxy that was consumed by the much larger Milky-Way. (Kanipe & Webb, 2017, 74).



(8" SCT @ f6.3 on an Atlas Gem, ZWO ASI294MC camera with L-Pro filter, 15 second subs, not guided, livestacked using Sharpcap for 75 seconds).

I was able to immediately see the dark feature that I noted last spring, called the "Eye of Omega". I would have liked to have gone a little deeper on the EAA observation, but telescope mount was in an awkward, near horizontal position, and guiding wasn't working very well. With this observation, I finally had a good view of the greatest globular cluster in the northern sky, a bucket-list astronomical goal that I had been carrying with me since the mid-80's when I had a brief visual glimpse of omega thru that 10" dob. Life is good!!

Then in late May of 2025, I found myself once again at Calhoun County Dark-Sky Park. While I planned on mostly EAA observing galaxies that night, I had set myself a special goal of viewing my favorite Calhoun 'Southern Sky object' - NGC5139 Omega Centauri! As it transited the meridian at 10:30pm, I made it my first target of the night and planned to spend some time on it. The night sky started off beautifully clear, transparent all the way to the horizon! After powering on the telescopes and cameras, I slewed the 8" to Spica to focus the camera and waited there for full darkness to fall.

Then I slewed the scope downwards in elevation until the 8" SCT optical tube and piggybacked EVO50mm refractor and counter-weight shaft were nearly parallel to the horizon. There, once again at 3.4 degrees above the horizon, just skimming along the distant tree tops was the great fabled globular cluster – "Omega Centauri"!



(EVO50mm & ZWO ASI294MC & L-Pro filter, ROI=4144, 30 sec subs, livestacked for 5 min).

Calhoun Park at 38.5 degrees latitude and its low tree-line southern horizon with nothing for 100 miles but the Appalachians' is one of those magical northern locations where NGC5139 can be spied. I was doing my happy dance with this EAA view of Omega!

To help visualize how large NGC5139 is in comparison with M13, the difference between ~10 million stars in Omega to ~500,000 stars in M13, here's both at the same image scale of 2072x1410 using the 8" SCT and ASI294MC pro camera.



(8" SCT @ f6.3 on an Atlas Gem, ZWO ASI294MC Pro camera with L-Pro filter, ROI=2072x1410, Omega = 30 second subs stacked for 2 minutes, M13 = 15 seconds stacked for 5 minutes).

Omega at +3.7 mag, 270 light-years in diameter and 17,000 LY distant, and visually 55 arcminutes in size and slightly larger than the angular size of the Full Moon, (Kanipe & Webb, 2017, 77), is easily visible to the naked-eye at higher elevations of a dark southern site, while popularly known M13 is +5.8 mag, 145 light-years in diameter and about 22,000 LY distant, and visually 20 arcminutes in size (about the angular size of the 1st Quarter Moon), (Kanipe & Webb, 2024, 181), can be a challenge to see naked-eye at a dark site under very good conditions.

With this last EAA observation of NGC5139, I can finally satisfy cross-off the cluster from my 1980's daydream bucket-list. I encourage other northern observers to also find a suitable southern location and view this giant stellar-city, the globular cluster "Omega Centauri".

Larry McHenry

Astronomical Webportal: <http://www.stellar-journeys.org/>

References:

Cloudy Nights. "Omega Centauri", <https://www.cloudynights.com/topic/924540-omega-centauri/?p=13488000>

Kanipe, J. & Webb, D. 2019. Annals of the Deep Sky Volume 5. Willmann-Bell

Kanipe, J. & Webb, D. 2019. Annals of the Deep Sky Volume 11. Willmann-Bell, AAS Sky Publishing