

Urban Observer

Loose Core Globular Clusters

NGC 288 & 2419

by David Nakamoto

dinakamoto@hotmail.com

Star clusters make for nice objects for urban observers, both visually and photographically. I think it's because they can be resolved into stars. Stars are easier to observe against the bright background that urban observers face, as opposed to diffuse objects like nebula and galaxies. It's the difference between the light concentrated into a point, as opposed to being spread out.

It also means it's easier to see colors in clusters. A fine example for open clusters is M-103 in Cassiopeia. It contains some red giants, some blue giants, and a smattering of fainter orange to yellowish stars. For globulars, M-13 in Hercules is a good one, filled with yellow and blue stars. The yellow stars appear brighter than the blue ones, probably due to the eye's response to colors at low brightness levels. This has always given me a strong three-dimensional effect with this globular. The fainter bluish stars seem to be in "the background" with the brighter looking yellow stars floating in front.

With globulars, they generally fall into two main groups. The more common type has a sharp concentration of stars in the middle. Like the core of most galaxies, this core is brighter than the rest of the cluster, and hence it's easier to spot. Most of the more familiar globulars are of this type. These include M13 and M3. The core seems to be this way because there is a strong concentration of mass, and in fact black holes have been indirectly detected in many of these types of globulars.

The other main group are globulars without a sharp concentration in the middle. This seems to be because there is no central concentration of mass. This means it's possible to see stars right to the center of the globular with amateur telescopes. Because of this, these loose core globulars have no distinct core, and hence are harder to observe since the distribution of stars is more evenly spread out.

In January there are two such globulars, one in the south-west, the other in the north-east.

=====

NGC-288

NGC-288 is in the south-east. It holds the distinction of being the NGC object closest to the south galactic pole point, less than a degree away. This means NGC-288 is located perpendicular to the

disk of the Milky Way. You're looking straight out of the disk of the Milky Way when you observe in this region of the sky.

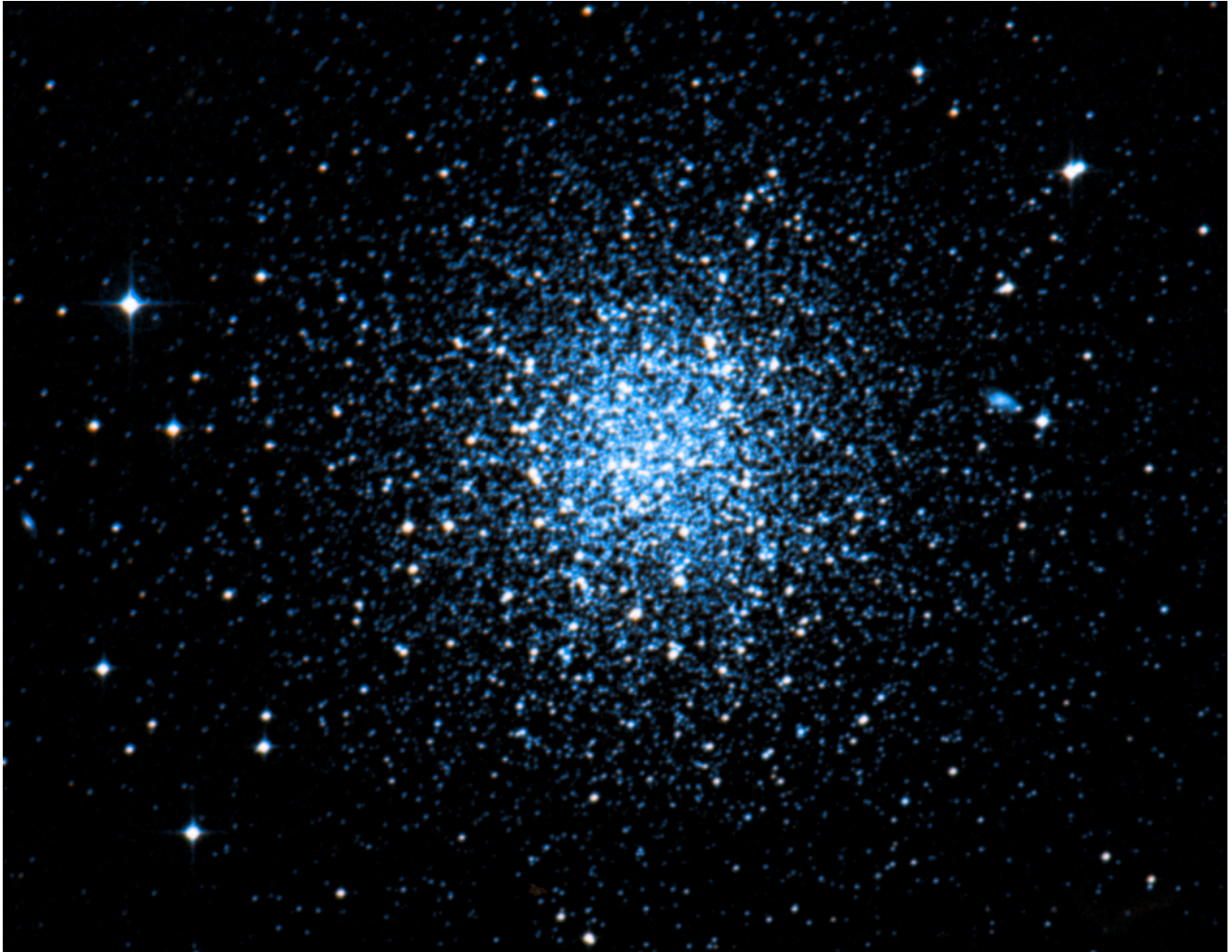
The only decent photograph I have of this object comes from way back in 2004 during the Nightfall star party at Borrego Springs. I used a Starlight Xpress MX-916 monochromatic camera, so the photo is black and white, but it shows off the cluster better than any other image I have. The monochromatic cameras have better light-gathering ability than color cameras. This is because filtering the light to get the three colors you need to produce a color image reduces the amount of light you gather for a given exposure, as compared to a monochromatic camera. My more recent images seem to show that this is a fairly faint globular, and hence long total exposures are needed.

Notice the elongated object to the right of 288. That's a small galaxy. Remember, the nearby Sculptor galaxy group is all around 288. There is also another small galaxy near the edge of the photo along the 7 o'clock line from 288.

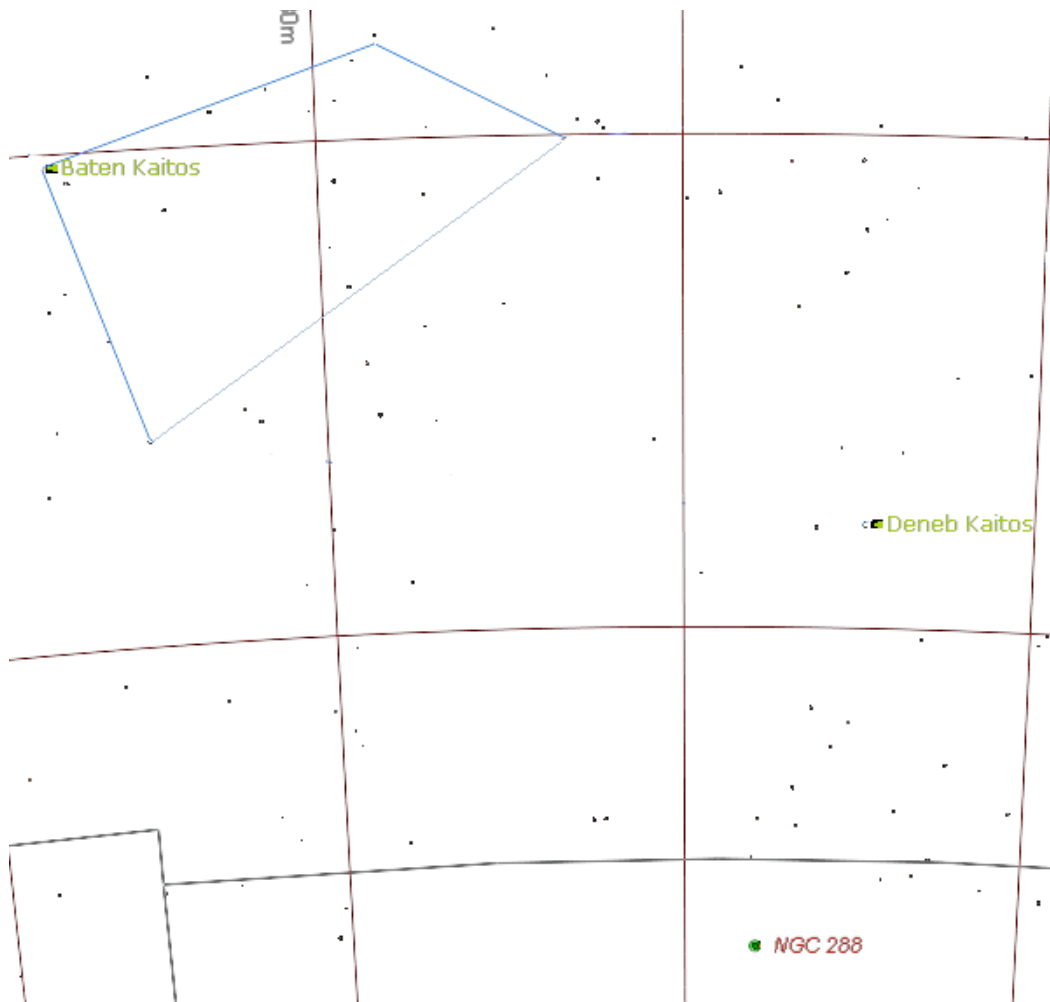


Although the above photo seems to show that NGC-288 has a condensed core, the false colored DSS image below, courtesy of the STScI website, shows this is not the case. NGC-288 isn't this blue; in fact, my color images hint that it is more yellowish in color, but take a look and see what you think.

By the way, I generate color images from the blue and red DSS photos by averaging the two to get the green image needed to generate a full color image. Of course, the assumption is that the green image is an average between the other two, and as I've found out with my own images, this is NOT necessarily the case for most deep sky objects, or even for stars, but it's the best that can be done. It at least gives some idea of what the object might look like.



NGC-288 was discovered by William Herschel on October 27th 1785. Much later its distance was determined to be about 29,000 light-years from us. It's located roughly 9 degrees along the 7 o'clock line from Deneb Kaitos, also known as beta Ceti, or the tail of the Whale. Kaitos is located west of the quadrilateral marking the lower portion of Cetus the Whale.



For those who wish to use setting circles:

RA 0hrs 43mins 35secs; Dec $-17^{\circ} 59' 12''$ (Deneb Kaitos)

RA 0hrs 52mins 45secs; Dec $-26^{\circ} 34' 57''$ (NGC-288)

So from beta Ceti, increase the RA by 9 minutes, and move south by 8 and a $\frac{1}{2}$ degrees.

=====

The second loose core globular is NGC-2417, located in the north-east corner of the sky for January. This globular has the nickname "The Intergalactic Wanderer". This is because of its tremendous distance from us, which at the time made it the most distant globular associated with our galaxy. In fact, it is around 300,000 light-years away, both from us and the Milky Way center. But in 2016, a globular was discovered in the constellation of Crater the Cup. It's now called Laevens-1, and it's 490,000 light-years away. If you want to see it, you'll need a very large scope, or a very long exposure times. DSS images barely show something is there, and those plates can go pretty faint, 20th mag or more.

William Herschel discovered NGC-2419 on December 31st 1788. Of course, its distance wasn't

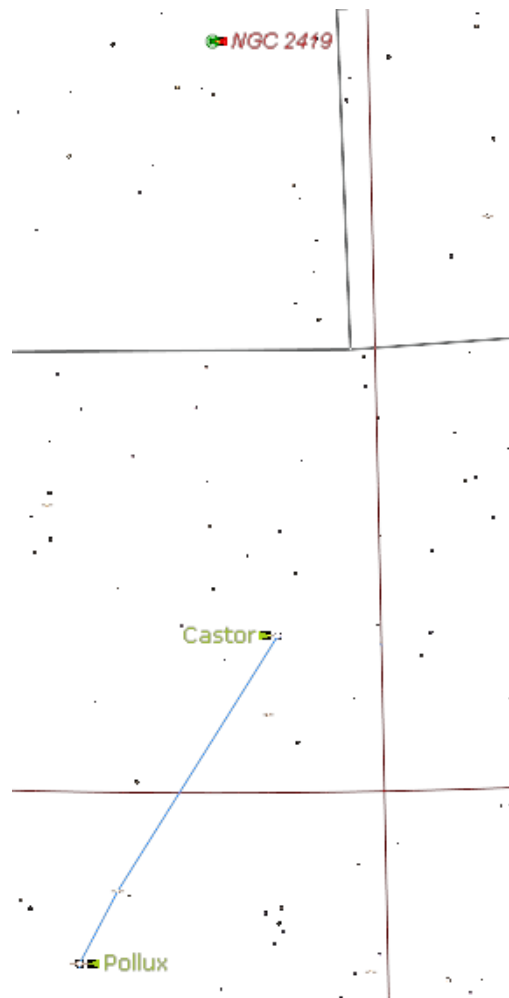
determined until much later, with the discovery of the Cepheid brightness vs. period rule. Objects beyond a couple of hundred light-years are beyond a direct parallax measurement until the launching of the Hipparchus spacecraft, but Cepheids provide a means of determining distances so long as you can measure their brightness and periods.

This is my image, a 300 second image, taken with my 10-inch f/4.5 Newtonian reflector and an Orion G3 color CCD camera, from my driveway in Azusa. This is a raw color image, so sky glow is apparent, but it helps to show the fainter regions of the globular. The colors might be off; the color balancing algorithm in the camera's software assumes the background is neutral gray, which a light polluted sky is not.



The bloated stars are due to the fast focal ratio of my telescope, f/4.5. This makes exposure times shorter, but it also spreads the light more than a longer focal ratio telescope. Another blurring factor is Seeing or air turbulence. This also spreads out the light. This might be partially defeated by taking a series of short exposures and summing them together, called stacking. I'll try this technique in the future and report back on my results.

NGC-2419 is located 7 degrees north of Castor in Gemini.



For those using setting circles:

RA 7hrs 34mins 36secs; Dec +31° 53' 18" (Castor)

RA 7hrs 38mins 8secs; Dec +38° 52' 55" (NGC-2419)

So simply go 8° north of Castor.

Clear and Steady Nights !