

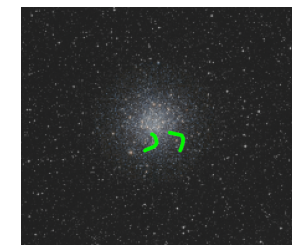
Data of the sky region at the time of the observation.....**SQM-L 21.8 IR -10 Temperature 14°**  
Data of the night.....**Sun alt: -27.5° Moon alt: -28.4°**  
Data of the object.....**Alt: 47.3° Az: 279.8°**  
Telescope .....**Stargate 18"**



Nagler 31mm (70x - 1° 10' - 6.6mm)

Quite large globular cluster where all the stars are resolved, more complicated in the core. Regarding its brightness is quite uniform, it does not highlight a central area much brighter than the outer halo of other clusters (as for example in M75), but the whole object has a nice uniformity of brightness which is not very intense. It is one of the least *compact* globular clusters I have observed that I can remember. Even, it almost seems to be looking at an open cluster because of how easily its stars are resolved were it not for the obvious ball-like accumulation of the stars. The brighter stars seem to have a reddish tone that contrasts with the rest of the paler, grayish stars.

As the outer stars are also resolved one can imagine shapes with the same. For example, to me it gives me the feeling of seeing curved arms of stars, ie it would be a kind of small hooks coming out of the cluster. This first impression has been very good with a BIG object, compensated (better than uniform because there is brightness variation but very little, it is like a very natural gradient) and easy to resolve and observe.

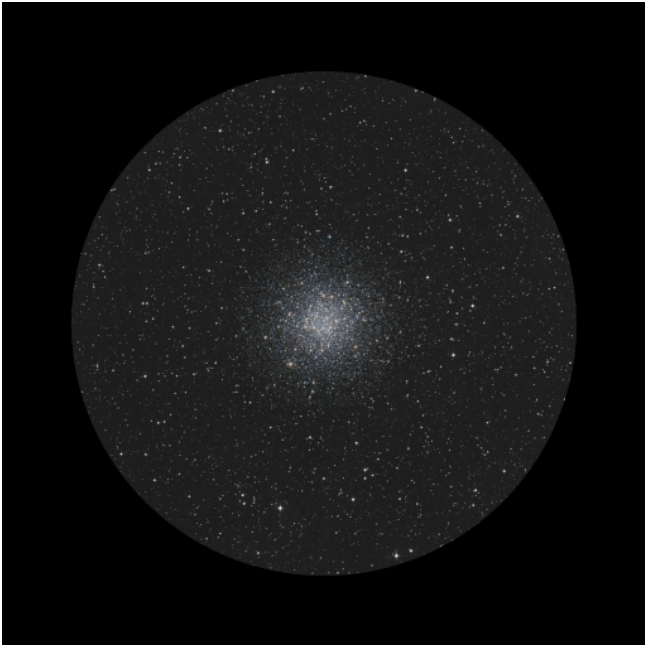


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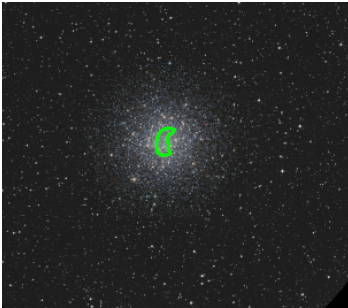
The cluster becomes much larger, occupying more than one fifth of the eyepiece. Its description becomes more complicated because structures in the central zone are beginning to appear. Describing the object from the outside to the inside of the cluster, first these single stars stand out, defining curved paths that approach the most central area of the cluster.

Then we have the center of the cluster itself, large and with a very similar and not intense brightness. But in the central part we can distinguish some regions poorer in stars that appear to the eye as dark rivers that separate islands or zones of brighter stars. This complex structure is a challenge for observation. The shape I appreciate is similar to an arrow with a very open tip, or rather like a wave with a pinnacle behind, it would be something like a

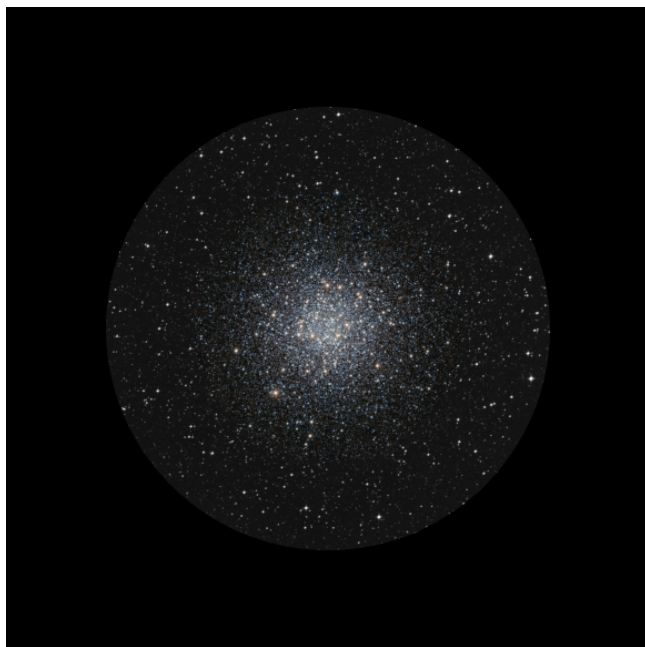
D but eliminating the left stick that joins the curve of the D, also this curve does not have a uniform thickness, that is, they are two darker lobes that narrow in the center. Note that all this occurs in the central part of the cluster where the brightness is supposed to be more uniform but clearly it is not, with these regions richer and poorer in more or less luminous stars. Specifically in the eastern part of the cluster core.



Nagler 22mm (98x - 50' - 4.7mm)



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Delos 14mm (154x - 28' - 3mm)

It is a delight to magnify this type of object because your vision changes with each jump in the eyepiece, gaining in detail, resolving more stars and yet without seeming to lose brightness.

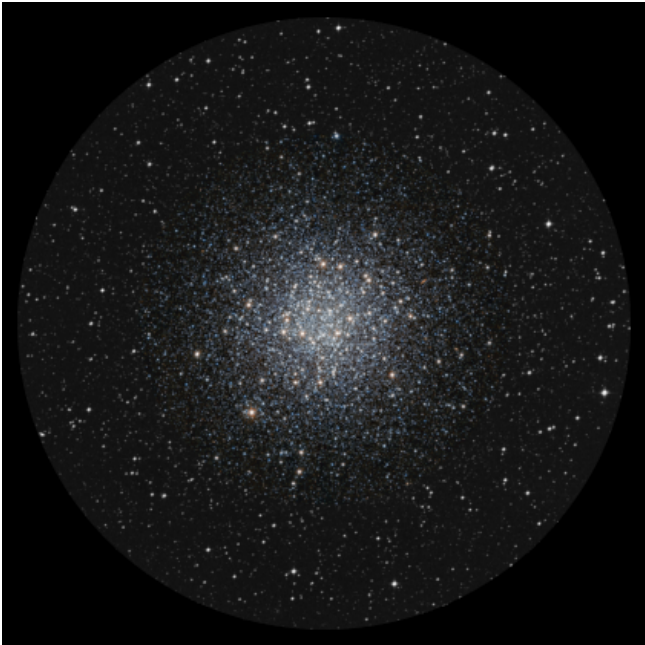
Now the cluster almost fits through the entire eyepiece and I don't see anything beyond the cluster itself when I place it in the center of the eyepiece. I look again more at the central part of the cluster and these regions of brightness difference. I seem to see even another area with a little less brightness, attached to this arc of the D, in the most central part of it. Again I am struck by the uniformity of the cluster, but not as bland, that is to say that it is boring, but on the contrary, the number of individual stars that are observed are equally distributed throughout the cluster. I do not see any special concentration zone, there is no clearly defined halo but there are brighter stars that stand out in the outer part of the cluster but all of it has a fairly similar brightness. It is

a complex object, because it has different structures but at the same time it is very chaotic and, in that chaos, there is some uniformity.

The word that comes to my mind is *compensated*, with no regions that stand out from the others.



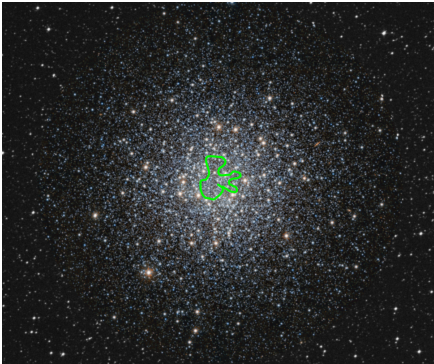
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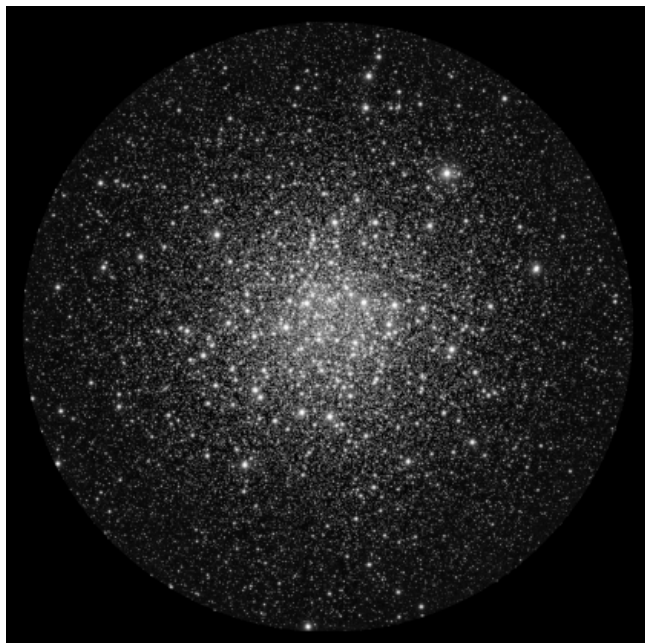
Ethos 10mm (216x - 27' - 2.1mm)

I have already commented many times but I love the Delos 14mm and Ethos 10mm eyepiece set, because the field remains practically the same but the magnifications grow. Now looking at this central area in more detail I seem to see four darker areas relative to the rest of the slightly brighter central area. As these four zones seem to meet in the center which in turn narrows, the image that comes to my mind is that of a butterfly. But a simple butterfly, the one we draw for the kids with four lobes, two wider at the bottom and two narrower at the top, something like that. It is complicated to observe because I am seeing areas of different brightness in the very core of the globular cluster but it is really suggestive and

catches the attention. It is impossible not to try to describe it and get more detail out of it. I keep adding magnification to better describe this central area.



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**Ethos 8mm (270x - 22' - 1.7mm)**

At this magnification I enter inside the cluster, and I have to move slightly with the motors to observe it from the outside to the inside. Something curious has also happened to me and it is that I stop seeing the colors so defined in the stars, now they are all of a more uniform color.

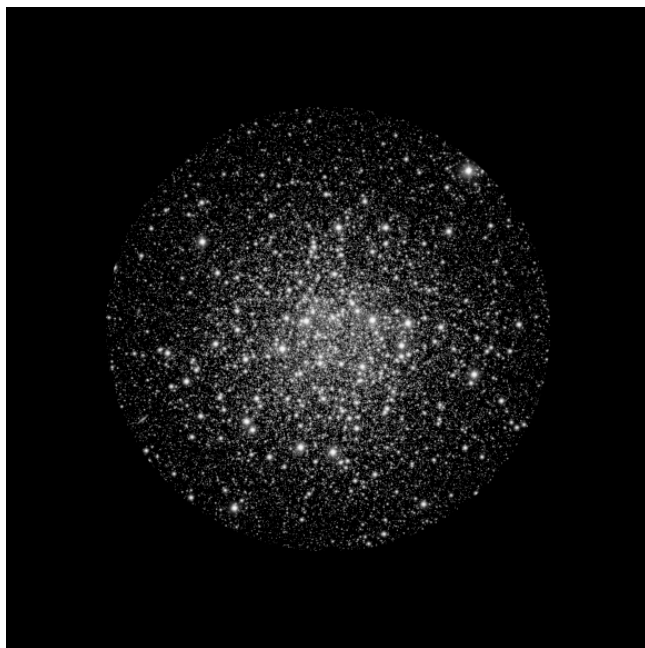
Starting from the external area of the cluster, I realize that I have lost some stars and only the brightest ones remain, so I have the feeling that the cluster has contracted a little or is not so rich in its external part, and the central area seems more spherical than with the other eyepieces. But what really catches my attention is the central region of the nucleus. Please note that everything I comment below should be imagined not as a super-bright central region like the rest of the globular clusters,

but rather as the natural continuation of a fairly uniform grouping of stars. I have repeated it many times but one of the things that has struck me the most is the lack of the *super-bright, variegated core* typical of globular clusters, so everything is more subtle and difficult to observe.

At these magnifications I no longer imagine a butterfly but I seem to see streams joining in the center of the object, I tell myself that it is very much worth the details I am trying to see and describe but at the same time I feel unable to explain the complexity of the core of the cluster, with these regions, so I jump to 4.5 to try to see it in more detail and to give a more accurate description.



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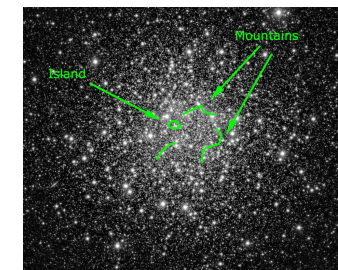
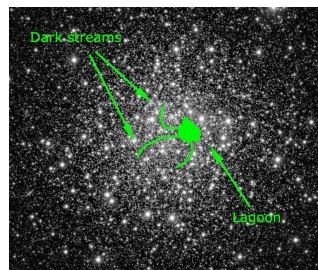


**Delos 4.5mm (480x - 9' - 1mm)**

BUAAAAAAAAHHHHHHH, BRUTAL the image with the 4.5. What I say to myself is that I have smashed the object. At these magnifications the cluster looks like an open cluster instead of a globular cluster, it is simply AMAZING and INCREDIBLE.

I see the core perfectly but at an incredible size with a lot of detail. I describe what I see. In principle I have already discarded the idea of butterfly and I start to see these regions of dark streams or rivers that converge in the interior of the cluster. It is very suggestive because it seems as if all of them were going to flow into a central lagoon where on one side of it there is an island of brighter stars. To understand it a little better, it is not that I see really dark areas, it is that I clearly see regions with individual bright stars (slightly brighter than the rest) that are also grouped forming rows, and at the edges of these rows is where these regions remain, as areas of lower brightness or dark rivers, but it is not black

or anything like that, it is still gray but a fainter gray (I hope I have explained better). So looking at these stars that I resolve even in the very center of the cluster, I start to do the opposite exercise, that is, instead of looking at these 'darker streams' look at the bright areas that delimit them and then the image that is formed in my mind is wonderful. Now instead of seeing dark rivers, what I see are *mountains*, *mountain ranges* or *islands* of stars. The brighter areas of the core, in contrast with these less bright, seem to rise above the rest with what, in your mind is drawn, a beautiful illusion of three-dimensionality. It is a pleasure to spend minutes quietly



gazing at the same part of the object, sometimes focusing on one aspect and then on the other, straining your eyes to the limit. I strongly suggest doing this exercise. Don't just keep the overview of what you see, but take one point and try to describe it to yourself. Ask your brain: but what are you seeing? where is the difference I see? how do I put words to it? and the image transforms almost magically. You begin to see details that leave you hooked on the object. In particular, that central part of the cluster, with those dark or bright areas depending on where you look, is a joy. Of course, you need to reach at least 400x to enjoy this image. Because, at that magnification, everything is perfectly separated and easy to observe. Then these regions, which were previously intuited, clearly appear, that wonderful complexity that gives it such a beautiful appearance in its interior. It really is a very interesting exercise to do and to enjoy. Of course, I think I have spent a total of 1h of observation to the object, but it is worth it.

