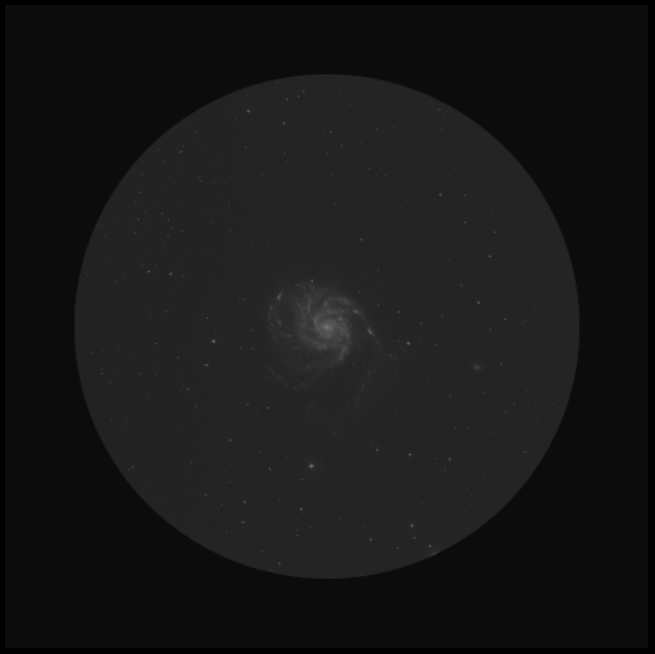
Messier 101

Ursae Majoris 14h 03m +54º 20' *Pinwheel Galaxy*

Data of the sky region at the time of the observation ..... **SQM-L 21.5 IR xx° Temperature 12°**
Data of the night ..... **Sun alt: -28.3° Moon alt: -18.3°**
Data of the object ..... **Alt: 64.5° Az: 318.7°**
Telescope ..... **Stargate 18"**



Nagler 31mm (70x - 1° 10' - 6.6mm)

I begin my notes by indicating that it is 2:00 am in the morning, the image is AMAZING and I am totally happy with the purchase simply for seeing objects like this. I start by really emphasizing the subtlety of the image as, even though, I distinguish many details it is not something one observes immediately, it requires a bit of patience, averted vision and taking your time.

The star field is nice with several stars of low brightness scattered randomly but without reaching the accumulation of the areas of the sky near the Milky Way.

Even at these magnifications the galaxy appears as a large grayish cloud (however it is about half a degree in diameter so it takes up almost 1/3 of the eyepiece for me). In the voice notes I mention that it is a LARGE galaxy as few I have seen through the telescope, of a very homogeneous brightness although the nucleus appears slightly brighter.

Obviously, it is all a matter of attention, but it is of such subtlety that it encourages you to look more closely. And, indeed, at this magnification you can already see differences in the structure of the galaxy. In addition, it transmits a sensation of a pinwheel that suits its name. Because, although it is still very subtle and difficult to observe, faint and less faint areas are already outlined, (especially in the outermost area) that transmits the feeling that the galaxy is spinning on itself.

After adding minutes of observation I notice that the arms are now more evident and I count 4 or 5 of them, I am not very sure. This calls my attention because in spite of the low magnifications and the fact that I see the galaxy BIG, I see so much detail in it that it is impossible not to remember famous pictures of M101 showing its arms with so much detail and so clearly.

Something that in visual, until this very moment, I had never seen, and really it is just pure joy to see such a beautiful image. But I insist that it is a matter of subtleties, you should not imagine, please, some arms clearly and intensely defined, it is simply a region that, when adapting the eye, you see that it is slightly brighter or rather, a little less dim than the rest of the galaxy. And it is then that you observe, self-absorbed, how in reality you are seeing an arm that extends around the galaxy, rotating around it, as if it wanted to sink it. And you keep looking and then you see another faint area to find another arm, which repeats the same shape but more external and more open. Then you look at the other side of the core and find the same, although here one of the arms is even more separated from the galaxy. It is simply beautiful. In addition some stars, dotted like pinheads, shine on the surface of the galaxy. Obviously they belong to our galaxy but it makes the image even more beautiful because, by resolving them completely, they do not lead you to confusion with the shape of the galaxy which is huge.

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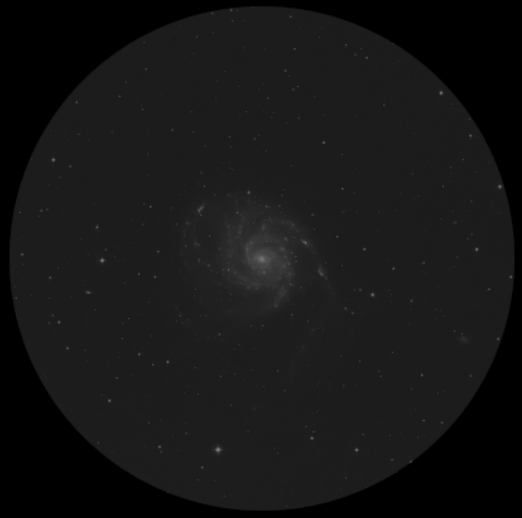

Nagler 22mm (98x - 50' - 4.7mm)

A new jump and new surprises in the galaxy.

It has gained in size until it almost covers the half of the eyepiece, I can still see the whole galaxy at a glance, but the background field is reduced. The arms are still resolving, I would even say that now more clearly than before (maybe my eyes are also getting used to the object), the nucleus, which now I can also distinguish more easily, seems to me elongated rather than round, but what really catches my attention are the structures that I begin to see in the arms. I repeat, please, that it is a matter of subtlety, nothing is totally evident, but by repeating the walk of the eye across the surface of the galaxy and always seeing the same thing, one is convinced that it is there. What I see are something like clumps or slightly brighter regions in various areas of the arms, in my voice notes I use the word '*accretions*'. Especially in the arm furthest away from the galaxy, which is about 3 o'clock in the famous clockwork distribution. This arm is the most striking because it moves farther away from the galaxy, that is to say, it surrounds it less, as if it were opening outwards. It is precisely in this arm where I see, at the end of it, a brighter area, with a brightness similar to the nucleus of the galaxy, perhaps a little less, but significantly brighter than the rest of the arm, which is more uniform. It is very curious because it is at the end of the arm itself. Consulting this region at home it turns out that it is NGC 5462, one of the famous H II regions of the galaxy. This region has led me to take an even better look at the arms and I think I can identify other similar areas (although not so obvious) but I do not write them down.

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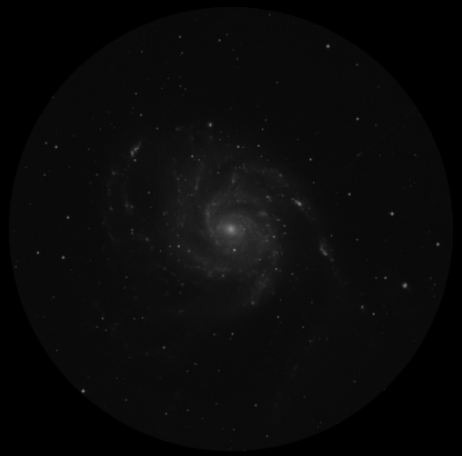

Delos 14mm (154x - 28' - 3mm)

I start my notes of the 14mm vision saying: '*F**K what a beauty, MY GOD, what a spectacular sight*!!!' Then I remember the first encounter I had with this galaxy with my old Meade 90mm refractor with which it all began, in El Berrocal, Huelva, which I could not see it even with a shot. And in which I made the same mistake that all novices in visual astronomy: *a galaxy of 7.8 magnitude, but if it must be SUPER BRIGHT, go for it*. But all my happiness went away because I couldn't find it no matter how much I went through the same area, again and again and again and again and again.

Now I am enjoying it with a 450mm and this changes a lot (of course my eyesight is not what it was and I notice it, but you can't have everything in life). The galaxy has gained in size until it almost occupies the ENTIRE eyepiece, and now the details of the galaxy are more and more evident and, therefore, it is more and more complex to observe and, without any doubt, more BEAUTIFUL.

First the nucleus, now I see it more defined than before, and of course it is round (before it seemed to me a little more elongated) but it is that the arms come out from the nucleus itself. Thanks to these magnifications everything is much larger and, something that surprises me incredibly for not being used to such large apertures, the galaxy hardly loses brightness, I would even say that it actually increases it? (now I remember some email from Ángel Huelmo explaining that in reality what is increasing is in contrast and probably that is what I was discovering). These two factors added together (more size and more contrast) allow me to see PERFECTLY (again, it is a matter of averted vision and subtleties, but now it is much easier than before, almost as soon as I put the eye in the eyepiece) the structure of the arms, easily counting 5 of them and delighting me with the '*gaps*' that exist between them that are thick enough to stop comfortably. On top of everything else, thanks to the magnification, the arms look VERY LONG, you can go through with your eyes from their *birth* and looking at every detail, how they extend, how they rotate on the galaxy itself and continue and continue. Something that leaves you almost breathless to know what you are seeing, which are millions and millions of suns spread on a surface with that shape. My head feels like it's going to explode with these thoughts, it's just AMAZING. I go back over the more open arm and I am delighted with the image of the outer bulge that also seems to *fit* perfectly with the shape of the arm, now more defined. But just before reaching it there is another region of equally bright but less intense concentration (NGC 5461 another region of H II). If I continue towards the interior of the galaxy, I pass by the nucleus and that complex structure with the birth of the different arms surrounding the galaxy. I continue a little more towards the outside, towards 9 o'clock, I see the somewhat fainter region between the arms, a new arm arrives with some condensation also in that arm (NGC 5453) but even more subtle, to continue with a large *hollow* space but less black than the previous one, and a new wider arm appears but also fainter that makes it difficult for me to know where the galaxy ends.

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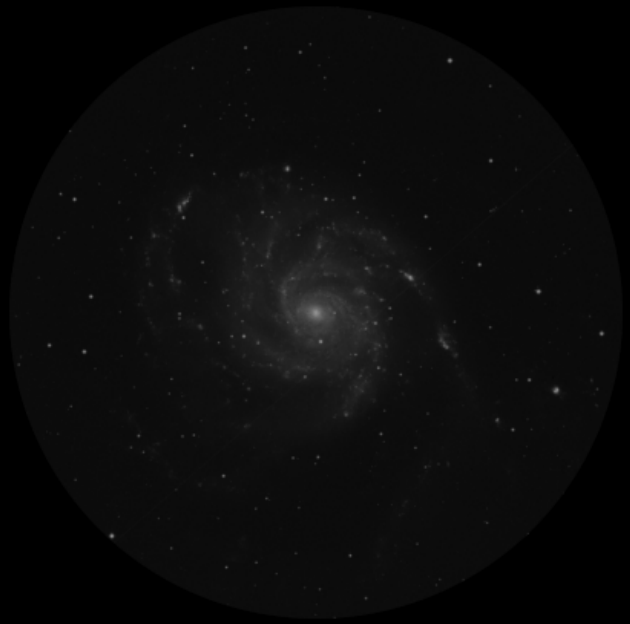

Ethos 10mm (216x - 27' - 2.1mm)

The grace of this new eyepiece is that, in spite of having gained in magnification, I have not lost field (because compared to the previous one it has much more apparent field), so I enjoy the same image but magnified. I look at the nucleus and I am struck by its structure. I started commenting that the nucleus was subtly brighter than the rest of the galaxy and now I can even distinguish different regions inside it, it is incredible. First its most central part that I see totally spherical and small, then there is a small drop in brightness to return to a zone of equal magnitude to the nucleus itself. It is from this second zone that the arms start, which seem to me even longer than in the previous vision. I start to go through the *open arm* of the 3 o'clock and I notice how its total brightness has been reduced with respect to the previous eyepiece but it also makes me highlight much better the regions of greater concentration, now I see with total clarity the brightest end of it, but also that area before the 5 o'clock of the arm itself, that is if we start from the final bright area of the arm, more external, this is turning towards the south where the galaxy is, a few *minutes* to reach the point where the arm turns there is a new concentration of brightness dimmer than the previous and less extensive.

It also draws my attention that the arms of the other zone of the galaxy (what would be the 9 o'clock of my eyepiece) seem to break or disappear in some areas, showing even more complex structures in the arms themselves. It is as if the arms are not uniform, but are made of patches with a faint background that gives it uniformity, but very very faint. I have a hard time continuing to describe it so I move on to the next eyepiece to get what I think will be maximum magnifications (but I was wrong).

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

I open the voice notes with this eyepiece with a high and accelerated intonation asking myself, which eyepiece is the best, because with each new magnification jump I see more details and I like it even more, even though I see it more faintly. With this eyepiece there is no background, I have gone INSIDE the galaxy itself, and I have to move the telescope axes to go through it. At the minimum speed of the motors, it is a pleasure to follow the structure of the arms that revolve around that clearly brighter nucleus and those hollows that help define the arms so well.

The central region of the galaxy attracts my attention, since it reproduces on a smaller scale what I see on the outside of the galaxy. From the beginning of the arms I see how they rotate around the nucleus of the galaxy, I mean, the arm actually begins in the nucleus in the same area where it ends. That is, if it is an arm that one sees to the west of the galaxy, it itself begins in the western part of the nucleus, making a complete turn around the nucleus before extending to the outside of the galaxy. The same happens with the other arm but starting from different points and as one following the other until they clearly separate.

I keep repeating how beautiful it all is, how precious I see it, and how magnificent it is to be able to add magnification and not stop seeing the previous to gain more detail. I comment again in my notes that all are degrees of subtleties of grays more or less intense but always faint, they are never something bright intense like a star, they are simply a little brighter areas that our brain highlights at the expense of insisting on observing, but when you see it is magnificent. And the good thing is that I am now seeing this sensation in a HUGE object and I can go around the galaxy at will. The size of M101 is surprising.

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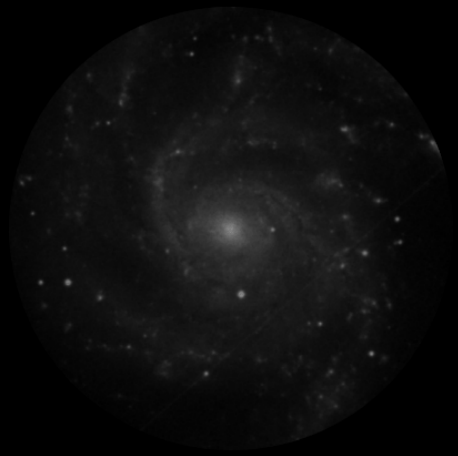
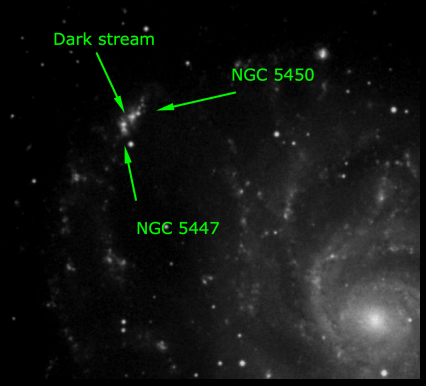


Delos 4.5mm (480x - 9' - 1mm)

I could not believe that at this magnification I could still see the galaxy with so much detail. Evidently I have lost brightness, but I am totally inside the galaxy, at this moment I have already spent more than 40min dedicated to the same object and at the end I will reach one hour as the observation time for M101. I have so many magnifications that going through an arm takes me a long time at minimum engine speed. And thanks to these magnifications I travel through areas where I do not see the galaxy to suddenly reappear the arm, and that leads me to a new discovery, well actually there are two.

On the one hand in what was my western arm of the galaxy, that is to say the one that was at 9 o'clock from the nucleus, not the one that had this zone of brightness that I have described in different occasions but the another one, I had believed to see a zone of more condensation of brightness in the end of this arm. Now, at 480x, what I see is not only a concentration of brightness but two bright regions separated by a dark area in the middle that gives it the shape of crab claws, can you imagine drawing a crab with the two claws upwards, separating each one from the other about 135°? Well, something like that, they are two bright areas (please understand by bright something slightly brighter, although at this magnification is that it is almost the only thing you see of the arm because it has already been reduced to a darkness indistinguishable from the background sky), I said that these two bright areas are the ones that appear as two clearly separated ovals opening towards the interior of the galaxy, with a dark stream that separates them, AMAZING (NGC 5450 - 5447).



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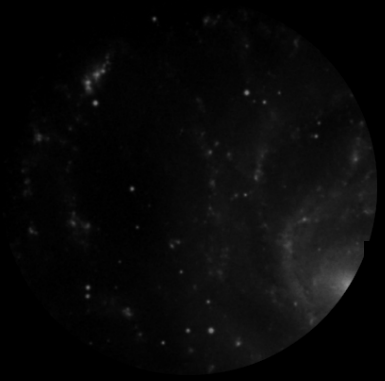

The other discovery was due to an error, returning to the area of the condensation of the 3 o'clock arm, I went too far, it is difficult to follow the galaxy well at this magnification, especially when you lose some areas of the arms and I saw a bright region but that did not remind me of what I had already seen. It was another companion galaxy of M101, NGC 5477, a dwarf galaxy without a defined nucleus, I was also surprised by its size at these magnifications. Finally note that at these magnifications in the nucleus I lose some details but it still seems to me a beautiful region, it is more complicated to see where the arms are born, but the nucleus, or rather the central part of the galaxy, looks like a galaxy itself with small arms surrounding it, a beauty.