

**From Impossible to Possible**  
**Magda Streicher - Presidential Address 2008**

My goal is to take on various deep sky projects and make the impossible possible during visual observations through my telescope. The key to success is dedication, and the bonus is awarded with observing skills. You might ask why I spend time in the wee hours of night trying to observe these faint objects. The answer is a straight forward one, my love for astronomy is timeless. Being motivated to look deeper than I ever thought possible. I once mentioned to another observer that heaven knows why I love the faint fuzzies so much, and his reply was: Because they are out there. Let me tell you about a few of the faint and elusive deep sky objects that for me became possible.

**1. Observing history of the nebulae around the star Eta Carinae.**

Inside NGC 3372, known as the eta Carina Nebula, the bright 3.5-magnitude orange Eta Carinae is also surrounded by an orange-red nebula about 15" wide, called the Homunculus nebula, named by Gaviola due to its resemblance to a small, stubby manikin. Detected visually by R.T.Innes in 1914, it was at first recorded as faint "companion stars". This nebula is expanding at 5000km/s, which pumps out as much energy in six seconds as our Sun does in an entire year.

My first real deep sky observation dates back to 2001 and I noted only two soft lobes embedded in haziness around the star Eta Carinae. On a yearly basis I found that the south-eastern lobe was getting slightly larger and brighter. Follow-up observations indicated dark markings superimposed on this SE lobe. Dark skies and averted vision even treated me to a faintly visible flare between the two lobes in 2005. Later observations indicate that Eta Carinae and the whole area around the star seem much brighter and dustier. The smaller NW lobe north proceeding looked notably smaller against the larger SE lobe compared to what my sketch indicated 4years ago.

My latest observation made in December 2007, indicated uneven surfaces on both the lobes. Three darker spots in the brighter lobe, one a tad brighter, were obvious. A small bright patch embedded in the smaller NW lobe is obvious. Two small dents, or notches, in the larger SE lobe on its NW peripheral rim, was a surprise. With slightly averted vision the lovely bladed fan between the two lobes was spotted with ease.

It is a scientific fact now that the nebula has brightened considerably over the last few years. The star varies slightly in brightness with a cycle of 5.52 years, which has been traced back to the 1950s. Maybe a supernova lingers on our doorstep, waiting on the verge of destruction at the very end of a short life.

**Targeted Fuzzies.**

**UGC 2838 - Galaxy imbedded in the Pleiades – Taurus.**  
**ESO: 172.7? - Bipolar Nebula - IRAS 12419-5414 - Centaurus**  
**LHA 120-N59c – Nebulae - Dorado**

**UGC 2838 - Taurus.**

The Pleiades star cluster has been known to the ancient world for thousands of years. But did you know that on its western edge still lingering in the nebulosity, is a faint galaxy (UGC 2838) keeping this cluster company, although much more distant. Star hopping is the best way to find these ultimate faint objects.

Starting at the 3.6-magnitude Electra in the NW part of the Pleiades star cluster, I hopped over to the 10-magnitude orange-coloured star GSC 1799 325 1, which is 12' NW from Electra. With a detailed star map the next target star seen is 11.1-magnitude GSC 1799 721, just 7' to the south.

The area around this star was sketched with high power (346-magnification) to reveal all the faint stars seen in a field of 4 arc minutes diameter. The position of the galaxy, RA: 03h43m38s and DEC: +24°03'40, is 1' north of this 11.1-magnitude star.

Checking over and over again I have come to the conclusion that a faint fuzzy spot more or less at this position could well be the edge-on galaxy UGC 2838, which I estimate around 15.5-magnitude. This observation has been one of the faintest ones of my life.

### **ESO: 172.7? - IRAS 12419-5414 – RA: 12h41m55s – DEC: -54°14'.9 - Centaurus**

This object, catalogued as ESO 172.7, was indicated as “peculiar”, as at the time astronomers were not aware of the object’s obscure nature. It has been discovered to be one of the coldest objects in the universe.

I Glass and G Werner, were the first to note this unusual nebulosity as a ‘butterfly or ‘bow-tie’ in shape, during an inspection of print number 172 from the ESO Quick Blue survey. Blue and visual plates were obtained using the Wynne corrector at the Newtonian focus of the 1.9-m telescope in Sutherland on 16 August 1978. It appears to belong to the class of bipolar nebulae discussed *inter-alia* by Calvert & Cohen (1978). Its dimensions from the blue plate, as measured by Mrs S Parker, are approximately 55 x 21 arc seconds. It is just visible on the Franklin-Adams Atlas plate of the region, taken in 1910. Photometry measured on the Johnson UBV system on the nights of 12, 25 and 26 July 1978 with the 0.5 and 1.0-m reflectors at Sutherland has yielded V= 12.68, B-V= +1.31, U-B= + 1.00

The central star, near spectral type G0 III, is surrounded by a dust shell. This object has been named the “Boomerang Nebula” in 1979. Thanks to Ian Glass who provided me with this information.

I had to try several times to observe this small, very faint object, my first impression being a very faint colourless elongated N-S nebula just about 1' in size. It can only be seen with careful observation, high power and with the use of filters. With filters it resembles two out-of-focus 11-magnitude stars closely on top of one another. The double-lobed nebula appears even in brightness, except for a small broken middle area. To observe this unique faint object through my 16” telescope brings such a feeling of achievement and joy.

### **LHA 120-N59c – (M2002) 163282 - Dorado**

Observing the Large Magellanic Cloud on the evening of the 5<sup>th</sup> August 2005 led me to find a small round patch of nebulosity just 2.7' SE of NGC 2035. All the nebulae in this area were brilliantly enhanced with an UHC Filter through the 12” telescope, 218x. I could not find any data about this nebular patch, so I forwarded my query to Brian Skiff, a professional astronomer at Lowell Observatory.

His reply was: “The object you have found was catalogued by Karl Henize in 1956 as his 'N59c', or more fully 'LHA 120-N59c'. It is centered on a 14.5-magnitude star that is obviously the star that fluoresces the circular nebula. The position of the star is: RA: 05h35.39.7 and DEC: -67°37'04".8 (J2000).

In the MC catalogue by Phil Massey (who is also at Lowell Observatory), it is called [M2002] 163282. His photometric data are:  $V = 14.55$ ,  $B-V = -0.05$ ,  $U-B = -1.01$ . The strong negative value for the U-B colour is indicative of a very hot star. Interestingly, the nebula is not drawn-in (*sic*) on Mati Morel's usually very complete large-scale maps of the Clouds”.

So I asked Mati Morel directly, and he replied to me as follows.

“Thanks for your interesting note. The region is shown on my chart 23 of “LMC Selected Areas” but the photo-chart I used as a basis probably did not show Henize N59c (or not very well), so it was ignored. I have looked at a print from UK Schmidt plate and, not surprisingly, N59c shows up very nicely. At least your observation proves that even this small nebula is within reach (visually) under good conditions”.

### **Possible third companion discovered? - Aries**

When checking the proper motion of all stars, you are bound to get stars of similar proper motion through space.

The cluster DoDz 1, in the constellation Aries, contains a double star in its southern extremity, consisting of a yellowish magnitude 8.5 primary and magnitude 12.7 companion with a separation of 29.4” in PA 342 degrees, listed as WDS02474+1713.2. The double star at the position of RA: 02h47m.4 – DEC: +17°13'24”, was observed by Tim Cooper and me on the night of the 30<sup>th</sup> October 2005. To our surprise and after further investigation by Cooper on DSS plates, it showed a possible third companion.

Again I questioned Brian Skiff who noted that it looked as though the faint third star (plus/minus) 16-magnitude, situated between the known pair, could possibly be a physical companion. Skiff noted “the data are not all that good for such a faint star, but the 2MASS colours at least do not totally exclude it”. Hopefully observations of proper motion over time will include or exclude this star as a third companion to WDS02474+1713.2.

### **Supernova 1987A – Sanduleak –69°202**

I normally shift from NGC 2070, the Tarantula Nebula, to the small star clusters NGC 2060, and further south NGC 2044, from where I star hop to the position of Supernova 1987A, although now after many telescope visits my eye reaches this area without difficulty. The titanic supernova explosion was first observed on 23 February 1987.

The star Sanduleak -69°202, which was 11.7-magnitude prior to outburst, was clearly visible at the time.

SN 1987A blazed with the power of 100 million suns for several months following its discovery and brightened up more than 2000 times. Although the supernova itself is now a million times fainter than 20 years ago, light echoes are just beginning to show in the space surrounding it.

I started to monitor and sketch this area carefully, which shows a very faint elongated NE-SW haze, which I estimate to be around 12" in size.

February 2007, brought a break-through in a perfectly clear night sky with excellent seeing conditions and excellent transparency with a limiting magnitude of 6.3, and with the area high up in the sky. With the 12" S/C telescope (342x), it revealed that this faint elongated haze was broken in two pieces towards the middle area. The next step was to measure the distance of the gap between the two pieces of the nebulosity, which I estimated around 4" in size. Tim Cooper visited me during November 2007, and our main aim was for him to identify and confirm the gap between the piece of nebulosity. To my great disappointment, the weather conditions were against us.

E-mails were flying between Auke and myself, trying to reveal the true identity of the two hazy pieces of nebulosity. DSS plates revealed a short string of very faint stars situated very close to one another barely 5" in size, corresponding well to the slender NW nebulosity seen through my telescope. I now know this to be the unresolved faint string of stars, but what about the other piece of nebulosity?

I used cross hairs to pin point stars down to magnitude 15.5 around the area in their correct positions as accurately as possible. Two faint stars, one on the NW, the other on the SE rims of the remnant were embedded in the possible nebulosity at the position of RA: 05h35m28.065s - DEC: -69°16'10.7"

We came to the conclusion, and suspected the possibility that the unidentified piece of nebulosity could well be the area closely around the site of the supernova.

Earlier this year, I asked Christopher Middleton, to provide me with a CCD picture of the area using his 12" S/C telescope and Starlight Xpress SXV-H9C camera. The two pieces show up clearly in his picture of 19 February 2008, which confirmed my observation, despite the electronic noise marks on the picture.

In conclusion, where do I stand now in my desperate search for the first traces of the light echo, the so-called circular reflection around SN 1987A? I really do not know but hopefully I will one day be able to exclaim 'I have seen it'.

A wise old astronomer once said, if you are not outside looking, you will only read about it. I decided to be out there looking.