

of gas by supernova explosions, galaxy merging and associated growth of central black holes are all key processes that remain poorly understood. In this talk, I will highlight how surveys of the gas and the stars in nearby and distant galaxies are shedding light on some of these key processes.

**Title: Music of the Stars - Probing Stellar Interiors Through Analysing the Surface Vibrations of Stars**

Date: 9 February 2012

Time: 11:00

Venue: 1986 Building

Speaker: Karen Pollard

Abstract: In this talk I will present an overview of our research project to observe and analyse the non-radial pulsations in selected stars. We are concentrating on gravity mode pulsators such as gamma Doradus stars and slowly pulsating B stars. I will describe the facilities we use at the Mt John University Observatory and well as presenting the results from some recent analyses. ☆

## deep-sky delights



### A Misty Cloud

by Magda Streicher  
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It is common for us as star-lovers always to be looking up at the starry skies and absorbing the wonder of them, but they always warrant a deeper look – and especially now, during the southern summer months, when the Large and Small Magellanic Clouds can be seen suspended against the night sky. Not only is the sight of these two Clouds a clear indicator of our place in the universe, but we are also privileged to be able to study these satellite galaxies situated relatively close by.

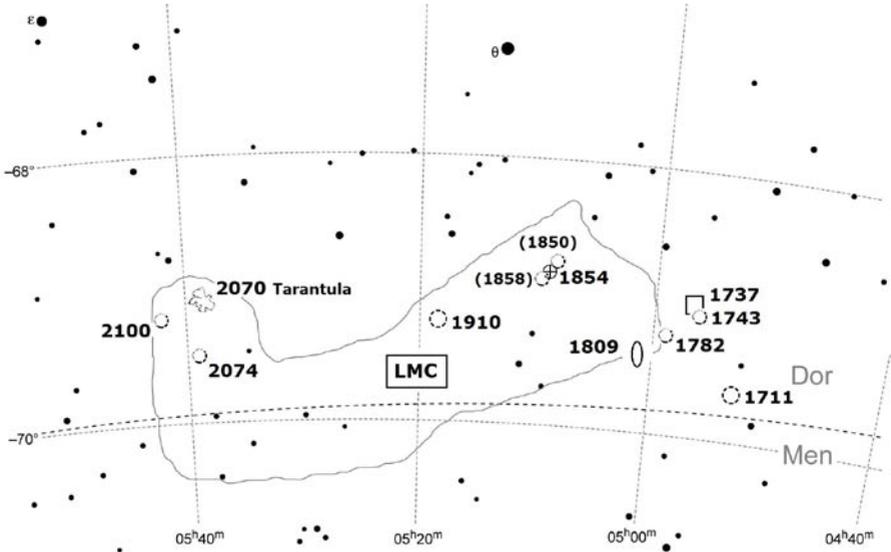
The Clouds are named after the Portuguese explorer Ferdinand Magellan who sailed the seas on behalf of the King

of Spain. The Magellanic Clouds, also known as dwarf galaxies, are headed for an unavoidable meeting with Mother Milky Way, which will shatter and engulf the two satellite systems – fortunately in cosmic time that will not point to an immediate disaster.

The ghostly glow of the LMC has bright objects in its midst and more than enough delights to enjoy even through binoculars alone. To study these objects it is best to search out very dark skies and have a good star map and a lot of time.

**NGC 1711** is located in the upper northern fringes of the LMC, one of many open clusters to be found in the Cloud. Although relatively small in size it displays a dense star-rich core with an uneven shape and featureless surface. With higher magnification many faint stars can be seen trailing out of the field of view.

## a misty cloud



A few emission nebulae are situated towards the north-west fringes of the cloud, an area which latterly has been covered in nebulosity. **NGC 1737** appears small but obvious, with a few knotted patches in its midst. On the outer edge faint stars are visible and various filters will improve the view in a magnificent way.

**NGC 1743** is just slightly brighter than its neighbours, situated just to the south of NGC 1737. The core of this cluster is bright and very tight, and an obvious star in the embedded nebulosity draws the eye slightly away. NGC 1740 towards the east is not at all easy to separate against the misty objects which share the field of view. In the vicinity the objects NGC 1745, NGC 1748 and NGC 1756 can also be found.

Moving deeper into the flimsy outer northern edge of the LMC, the open cluster **NGC 1782** is embedded in a piece of nebulosity. It is a small cluster interwoven with haze but, strangely, easily seen – although, sadly, with no stars resolved. The clusters NGC 1767 towards the west and NGC 1772 slightly further south can also be glimpsed in a wide field of view.

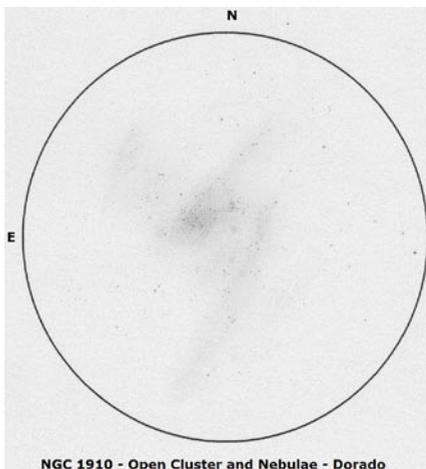
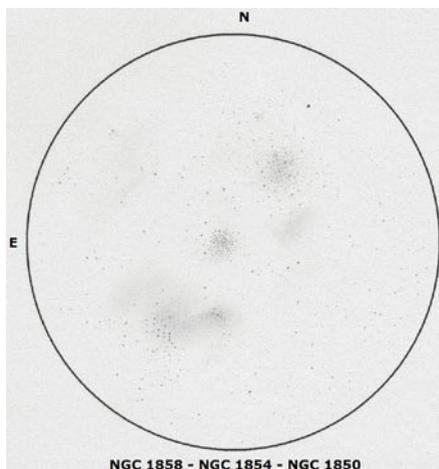
Would you have guessed that you might discover a galaxy in the misty cloud? Well, the edge-on galaxy **NGC 1809** could be confused with a piece of cloudy nebulosity situated just 24' south-east from the clusters above. However, careful observation through a telescope will reveal its elongated north-south spindle. The magnitude 8 star (HD 33031) can serve as a guide just 4' towards the north. This area is dotted with knots of faint

stars. It is by no means an easy object to find in such a busy, hazy star field, and I found averted vision to be my best way of discerning this galaxy.

Favourites among many of us are the very popular globular clusters, of which quite a few can be found in the LMC. **NGC 1854** rides comfortably towards the very dense middle area covered with many faint stars embedded in the obvious nebulosity. The globular cluster is relatively bright, round in shape, with a small dense core and surprisingly outstanding against the background star field. It is difficult to resolve any stars which cling tightly together. The relatively large open cluster NGC 1850 is situated 6' towards the north-west, with the smaller cluster NGC 1858 just to the south of NGC 1854 (see sketch below). The larger and very much more gaseous glow of both NGC 1856 and NGC 1858 towards the south is a feast to the eye, with faint stars embedded in the pieces of nebulosity.

The deep inner part of the LMC can only be described as impressive, with nebulosity and haze woven like braid that mingling well with faint splinter stars. One of the most outstanding clusters, **NGC 1910**, shares this field, displaying a mass of faint stars. Higher magnification will bring out faint knots and strings of just visible starlight. The cluster, which is truly a showpiece, is larger and brighter than most of the clusters in the Cloud. With careful observation dark areas can be detected in the misty surroundings. It is one of the most beautiful regions inside the LMC (see sketch below).

**NGC 2070** is situated in a rich and impressive part of the LMC, and is one of the most outstanding objects against our southern hemisphere skies. It is easy to see why this object is nicknamed the Tarantula Nebula as it appears to sit in its delicately woven web. The object is saturate with faint, flimsy nebulosity strings and wisps



## a misty cloud

of haze, which is quite impressive. There are so many facets to this object situated in this beautiful, full field of delight. The object with its nickname brings to mind the Golden Garden Orb-Web spider found in the northern parts of South Africa. When the sun shines on the spider and its web the golden colour is reflected and creates an amazing shiny impression. It is incredible that the male which is one-tenth the size of the female, lives on the outer edge of the web. As soon as the female feeds, the tiny little male will quickly impregnate her before she possibly sees him as potential prey to be devoured (see picture). Explore the spider's web and its numerous silky smears of light which are saturated with tiny little star clusters and numerous delicate streaks of haze.



A close neighbour to NGC 2070 is **NGC 2074**, situated further south. It is a rich cluster of stars embedded in the diffuse nebula which extends slightly southwards away from the stars.

The small open cluster **NGC 2100** is situated within the very extreme eastern edge of the LMC. It is bright and outstanding against the busy star field with a relatively tight core. Higher magnification shows off a few brighter stars embedded in the misty glow of the object. Fainter stars can be glimpsed around the edges

that complement the cluster to its full.

The LMC is one of a kind, and what a feast to the eye of us humans, who can only gaze in wonder at the starry skies with their amazing objects. ☆

Object	Type	RA (J2000.0)	Dec	Mag.	Size
NGC 1711	Open Cluster	04 <sup>h</sup> 50 <sup>m</sup> 6	-69°50'	10	2.3'
NGC 1737	Emission Nebula	04 54 0	-69 10	9-10	50"
NGC 1743	Diffuse Nebula	04 54 5	-69 12	8-9	2'
NGC 1782	Open Cluster/Neb	04 57 8	-69 23	8-9	3'
NGC 1809	Galaxy	05 02 5	-69 34	12	3.2'x0.8'
NGC 1854	Globular Cluster	05 09 3	-68 51	10.4	1'
NGC 1910	Open Cluster	05 18 7	-69 14	11.2	8'
NGC 2070	Bright Nebula	05 38 6	-69 06	1-5	30'x20'
NGC 2074	Bright Nebula	05 39 3	-69 30	8	4.0'x2.5'
NGC 2100	Open Cluster	05 42 2	-69 13	9.6	2.8'