Imagine yourself at a star party somewhere on the planet where the southern sky is visible, or at least the zone around -40 degrees of declination is above the horizon. You will surely hear other observers talking about and planning observations of the most-known galaxy groupings like those situated in Virgo, Fornax or Perseus. If you are familiar with this kind of structure in the night sky, there is a good opportunity to add another cluster to your list carrying out an optical survey looking for a less known and fainter cluster which is not frequently mentioned in the observers’ world, the Antlia Cluster.

The literature states that this is the third nearest populous galaxy cluster in the whole sky, so I decided to carry out my own project to study this entity in detail using a common telescope and, like with other observing projects, have an empirical description of it, thus finding out how many and which members are in the range of an 8-inch telescope, getting conclusions and saving observations for other observers or for future new observations of this target.

The inconspicuous constellation Antlia, visible during the autumn months in the southern hemisphere and composed of stars with magnitudes between 4.3 and 4.8, hosts this galaxy grouping situated 35Mpc away (about 115 million light years), described as “a beautiful, small, nearby cluster of Bautz-Morgan type III”
that is the third nearest galaxy cluster to us, inhabiting the eastern part of this constellation (see picture on first page).

Antlia cluster, also known as ACO S 0636, is centered at R.A. 10h 30m 01s Dec. −35° 19’ 35”. With a galactic latitude of 19 degrees it is not too far from the Zone of Avoidance (ZOA), a narrow band on the sky in which very few galaxies were found and catalogued and produced by the large clouds of gas and dust along the plane of the Milky Way.

I spent two nights observing the 1-degree field under analysis. The first night, the winter night sky was amazingly clean, with a very good transparency and a very good seeing. This made possible to enjoy the starry sky with the naked eye and get the best view ever of the zodiacal light from the nearby site before starting with the observing project.

I began the observation with the cluster at 63 degrees of altitude at only 6 minutes of the ending of the Astronomical Twilight. The first step was to identify constellation Antlia whose stars, although faint, were clearly visible to the naked eye. Once the constellation was identified I focused on the region where the cluster lies. To make this possible it is necessary to fix our view on the eastern part of the constellation and identify the stars $\alpha$ and $\delta$ Antliae that have similar brightness (visual magnitudes 4.6 and 4.3 respectively). Another “key” star to find the zone under study is the 5.3 magnitude star HD 90132 which is also visible to the naked eye appearing fainter than the other two (see picture on first page).

**The Core of Antlia Cluster**

According with F. Faifer et al. in their paper “GEMINI-GMOS Spectroscopy in the Antlia Cluster” (2008), Antlia exhibits a complex structure consisting of several subgroups, the most important ones being dominated by the giant ellipticals NGC 3258 and NGC 3268 as it is indicated in the DSS image here.

The search of the field was made using 42x that offers a 1.12 degree field of view in my 8-inch telescope. The field of the core of the cluster was recognized observing a line of three stars indicated with a red ellipse in Figure 1, a chain of stars with magnitudes 8.6, 11 and 12.2. A sort of parallelogram composed by some of the brightest stars in the field was also identified. Actually, the star HD 91249 indicated with a blue arrow in Figure 1 (spectral type: K0III/IV) is the brightest in the field with a magnitude of 7.2. Other interesting feature there is an arrangement of stars that form a “Y-shaped” structure (indicated by blue lines in Figure 1). At this magnification, patches of diffuse nebulosity appear in the zone coincident with the positions of the galaxies NGC 3268 and 3267.

A few other NGC galaxies populate the region surrounding these galaxies.
NGC 3269
This member of the cluster is an SB0-a galaxy according to the Wolfgang Steinicke's Revised NGC and IC Catalog. At 42x it was glimpsed using averted vision appearing as a very small and faint patch of light. I could find the accurate position in the field using the stars enclosed by the gray square in Figure 1. With a magnitude of 12.3 and a surface brightness of 13.2 mag per square arc min it was hard to observe at this magnification. At higher magnification (78x) it was more easily seen appearing little elongated. Always averted vision was necessary.

In the paper “The Globular Cluster Systems of NGC 3258 and NGC 3268 in the Antlia Cluster” B. Dirsch, T. Richtler and L.P. Bassino state that this galaxy shows a compact absorption feature 4" in size that at the distance of NGC 3269 it would have a diameter of approximately 500pc. The existence of this dusty region in a galaxy which otherwise is devoid of gas and dust is by itself peculiar and it is an intriguing question whether this cloud is indeed in NGC3269 or whether it is a foreground object in the Galaxy.

NGC 3268 & NGC 3267
John F. W. Herschel discovered this galaxy in 1835, an E2 galaxy according to the Wolfgang Steinicke's Revised NGC and IC Catalog. This 11.5 magnitude (SB: 13.8 mag per square arc min) member who dominates the northern subgroup of the cluster was visible with its close, fainter and harder to see neighbor NGC 3267 applying averted vision, which is visible to the right of NGC 3268 in the picture here. Appearing a little fainter than NGC 3271 which was (for me) the brightest galaxy in the cluster, it looked somewhat similar to that galaxy with smooth brightness and round in shape. This pair was better viewed at higher magnification (78x) with NGC 3268 being brighter and more easy to see. On the other hand, NGC 3267 requires a more detailed view and averted vision to improve the detection looking smooth in appearance.

NGC 3271
Although faint, this SB0 galaxy (according to the Wolfgang Steinicke's Revised NGC and IC Catalog) was easier to detect and observe at 42x appearing rather round and like a featureless small patch of light. This 11.8 mag. SB: 13.6 mag per square arc min galaxy was observed with 78x when it was at an altitude of about 37 degrees appearing more obvious and sharper with its core looking a little brighter for moments. It is also catalogued as IC 2585.

NGC 3258 & NGC 3260
In the southwest corner of the Antlia Cluster core’s field we find NGC 3258 which is the dominating galaxy in the southern subgroup, an E1 type galaxy according to the Wolfgang Steinicke's Revised NGC and IC Catalog with a magnitude of 11.5 and a surface brightness of 13.7 mag per square arc min. This galaxy and its nearby companion were visible through my 8-inch working at low power (42x) and using once again averted vision. Like the other members of the cluster, NGC 3258 and NGC 3260...
looked very faint and small. At 78x both galaxies were more clearly visible looking rather similar with a roundish shape. NGC 3258 looked a little bigger and for moments appeared sharper than its companion. Both galaxies were discovered by John F. W. Herschel in 1834.

**NGC 3273**
Also catalogued as PGC² 30992, this SB0 galaxy, according to the Wolfgang Steinicke’s Revised NGC and IC Catalog, was in the observing scenario. Being perhaps the faintest of the major galaxies in the cluster (m_v: 12.5 mag  SB: 12.5 mag per square arc min), I could glimpse it for moments using averted vision when it was at an altitude of about 45 degrees. Figure 1 shows with a gray ellipse some stars that were useful to find the zone where this galaxy lies. Even at 78x this galaxy was very faint but it is in a reach of an 8-inch telescope when the observation is make under good sky conditions.

**Dwarf Galaxies in the Antlia Cluster**
In the paper “Two Confirmed Compact Elliptical Galaxies in the Antlia Cluster”, A. V. Smith Castelli, F. R. Faifer, L. P. Bassino, G. A. Romero, S. A. Cellone and T. Richtler, researchers of Universities in Argentina and Chile, confirm the existence of two compact elliptical (cE) galaxies in the central region of the Antlia cluster. Thus, Antlia becomes the nearest galaxy cluster harboring more than one cE galaxy among its galaxy population.

Compact elliptical (cE) galaxies constitute a very rare type of objects as only about a dozen have been identified up to a distance of 100 Mpc (e.g. Chilingarian et al. 2007, 2009; Price et al. 2009). The prototype of this class is M32 (but see Graham 2002) and their main characteristics are a high central and effective surface brightness for their luminosities, and a high degree of compactness. The confirmed galaxies are named FS90² 110 & FS90 192 and are shown in the DSS images here.

**Table 1** “FS90 galaxies in our MOSAIC field of the central Antlia region” of the paper
| Galaxy populations in the Antlia cluster. I. Photometric properties of early-type galaxies (Analia V. Smith Castelli et. Al.) lists some FS90 galaxies including the two compact galaxies. Total Washington T1 magnitudes for these galaxies, taken from CT1 photometry of Antlia early-type galaxies (Smith+, 2008) are 15.49 for FS90 110 and 16.7 for FS90 192. They are target reserved for advanced astrophotographers or skilled observers with big aperture telescopes.

**Getting Deeper. High Power Looking for Faint Members of the Cluster**
I spent the second observing night to scan the 1-degree field using 106x. The goal, to determine how many and which galaxies, visually identified on the DSS image and shown in Figure 2, were visible through an 8-inch telescope under the observing conditions that night. The disadvantage issue was the relatively low altitude of the cluster at the moment of the observation of these galaxies, about 35°.

A short chain of faint galaxies in the eastern edge of the field (middle and on the left edge of the field, see Figures 1 and 2) was out of reach of my 8-inch telescope. Figure 3 shows

**Figure 2. Field of the Antlia Cluster.** I have plotted with red squares the galaxies visually identified on a DSS image. Even more galaxies, very faint and small, are situated in this field.
the position of NGC 3258C, about 18 arc min east-northeast of NGC 3268. This SBa galaxy has a magnitude of 13.7, SB: 13.4 mag per square arc min and it was not visible in my 8-inch telescope. About 24 arc min to the east-southeast of NGC 3268 lies NGC 3258D, another challenging galaxy for an 8-inch mirror. This SBB galaxy has a magnitude of 13.2 and a surface brightness of 13.4 mag per square arc min, so although something appears to be barely glimpsed momentarily I think it is a faint galaxy for an 8-inch telescope. However, this galaxy should be visible with this kind of telescope under a sky with a limiting magnitude of 6.6 or even darker according to the "Threshold Method", one of the ODM methods. NGC 3258D can be a good target to test the sky quality and the visual acuity of the observer.

When I observe the sky I have a motto, *if I am doubtful about the visibility of an object that I am trying to see at the eyepiece field of my telescope I must say "I didn't see it".* This was the case with NGC 3258D (explained above) and with a seemingly very faint galaxy, LEDA 83082, which lies about 6 arc min to the south-southwest of NGC 3268. Observing carefully in the position where this galaxy lies something appears to be there. If we are guided by data about the magnitude of this object (around 14.9) it is without a doubt a faint galaxy for an 8-inch telescope so maybe I saw the faint star immediately to the east (?). Another possibility is the fact that to be at the threshold of visibility played a trick on my eye. For sure bigger telescopes are necessary for detecting this faint member of the cluster and be sure it is visible for visual observers.

NGC 3257, an E/SB0 galaxy located about 3.5 arc minutes to the south-southwest of NGC 3258 has a magnitude of 13.1 and a surface brightness of 13.1 with an angular dimension of 1.0 x 0.9 arc min (Revised NGC Data [http://spider.seds.org/ngc/revngcic.cgi?NGC3257](http://spider.seds.org/ngc/revngcic.cgi?NGC3257)). According with some ODM methods this object should be visible through an 8-inch telescope under a 6.2 limiting magnitude sky. Observing carefully using 106x a very faint and small nebulosity could be glimpsed for moments using averted vision but a new observation using a bigger telescope would be useful for a sharper view.

Autumn in the southern hemisphere is the best season of the year to observe constellation Antlia and the cluster situated there. It is definitively a rather obscure target for observer with common telescopes but it is a good opportunity to aim our optical instruments there and see deeper into our nearby universe.

Thank you to Rose City Astronomer Jan Keiski for grammar checking.

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2. **FS90** is a catalogue compiled by Fergusson and Sandage in 1990. They identified 375 galaxies within a projected area of 8 Mpc2 that are listed in the FS90 Antlia Group Catalogue.

4. **LEDA** stands for Lyon Meudon Extragalactic Database. It has been the first Extragalactic Database. It was created in 1983 at Lyon Observatory. Since this time, the database has been continuously updated. The main idea is to collect raw measurements (coming directly from observations) and to archive them.