

# INTERACTING GALAXIES IN THE SOUTHERN SKY

by Leo Cavagnaro

The observation of galaxies, specifically compact groups, chains and interacting galaxies are one of the most enjoyable and exciting activities for those amateur astronomers who carry out detailed observations.

There are some well known catalogues which list these kinds of deep-sky objects. The Vorontsov-Velyaminov Catalogue of Interacting Galaxies, the Atlas of Peculiar Galaxies of H. Arp and the Shakhbazian Catalogue are some examples. Most of the galaxies included in them are only visible using telescopes with big apertures (18" or more).

Working at my desk, using software and articles I have in my computer, I was studying the southern sky centered in Right Ascension 22 hours and found some interesting groups and chains of galaxies mostly situated in constellation Grus and also in constellations Pisces Austrinus (the southern fish), Sculptor, Phoenix, Sagittarius, Indus, Telescopium and Pavo. I was reading the paper written by Arp & Madore "**A Catalogue of Southern Peculiar Galaxies and Associations**", where galaxies from the South Celestial Pole to a declination of  $-22$  degrees are catalogued in different categories according to the type of interactions.



This photograph was taken by Jan Keiski at Paramillos, an observing site around 9,000 feet high where I went to finish my observations. The picture shows constellations Grus, Indus, Tucana and Pavo, the zone where the galaxies in this article are situated. You can see Venus (lower right) and also the glow from Santiago, Chile, situated about 106 miles away in a straight line (lower center).

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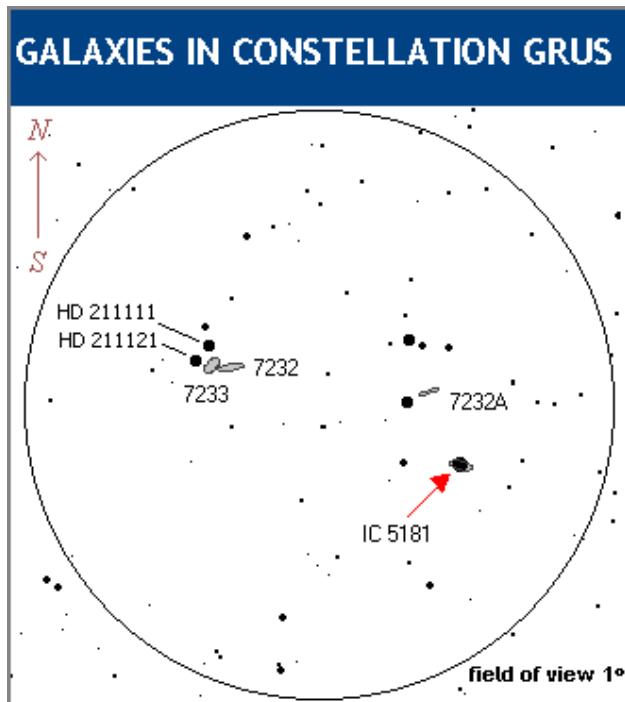
## Southern Interacting Galaxies *(Continued from page 5)*

I made an observing program which includes a sample of galaxies that are visible in the spring southern sky. In this article I have included my comments and reports about the observations of some of those galaxies through my 8" telescope.

On Saturday, December 20, I had a chance to set up my telescope in a nearby observing site (Canota) to begin the program. The Summer Solstice for those who live here in the Southern Hemisphere occurred on Sunday, December 21 at 12:04am UT, so that made for a short night for observing. The astronomical twilight (Sun is 18 degrees below horizon) occurred at 10:26pm local time. This night was clear but very warm even at the mountains. A hot wind and turbulent air in the atmosphere did not help much to get good seeing, so I think I could get even better views of the faint associations and interacting galaxies I saw that night if I observe them under a more steady sky. One week later, on Saturday, December 27, I went to Paramillos 9,000 feet above sea level to finish the observations. From this last place I observed the Pavo Group and a group of three galaxies in Grus. Both nights the region of the sky where these galaxies are situated was at low altitude because of the time of the year. I could not observe that region earlier this year because of bad weather during some New Moon weekends.

### The Pair NGC 7232 / NGC 7233 and the Galaxy IC 5181 in Constellation Grus

Not so far from the bright star Al Nair in the southern constellation Grus, are found galaxies that are visible in the same 1 degree field of view.

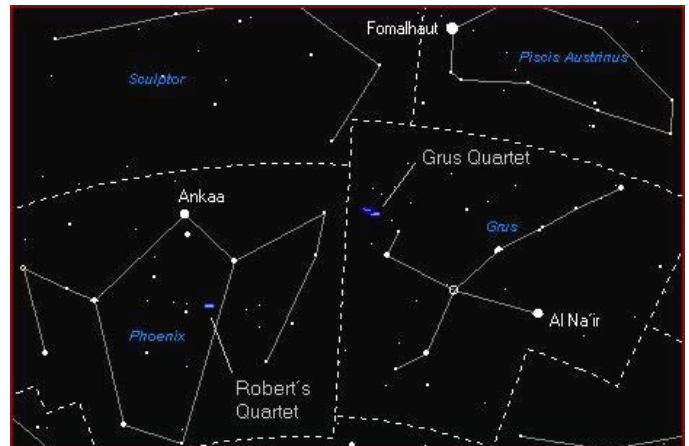


I began the observation at 11:20pm local time with the zone at about 28 degrees of altitude toward the west. The first attempt to observe these galaxies was using low power (42x). At that magnification you can see an interesting star field with some stars forming interesting shapes like the pair of stars HD 211111 and HD 211121 (see picture lower left on this page) that is useful to use as a guide to find and see the galactic pair close to them (NGC 7232 & NGC 7233). At this magnification IC 5181, a lenticular galaxy (S0), is the only galaxy I could see, and it looked very small. At 78x I could improve the view. Now IC 5181 is visible showing an elongated shape and a very small and brighter core, as it appears in the DSS image. Where the galactic pair lies, very close to the pair of stars of magnitude between 8 and 9, a very faint and little elongated hazy patch is visible using averted vision. The view was very difficult and it was impossible to discern the galaxies.

At higher magnification (106x) the galaxy IC 5181 looks interesting, with its bright core showing better. The view of NGC 7232 & NGC 7233 is similar to the one I got with the lower

### A Couple of Southern Quartets

magnification. NGC 7232A, the faintest of the four galaxies



was not visible through my 8-inch telescope.

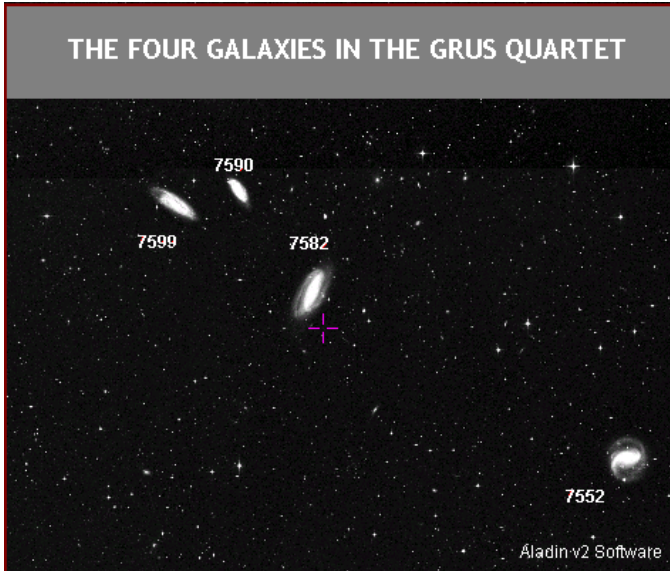
### The Grus Quartet

In constellation Phoenix, R.A. 23h 18m 53s Dec -42.3 degrees, resides a small group of four galaxies. This is a good example of a galaxy quartet in the southern hemisphere. The brightness of its members makes it possible to observe them properly with a small telescope like 8-inch dobsonian. The first observation of this object was at local Midnight, when the group was 30 degrees high in the western sky. Using low magnification (42x) the galaxies are very well detected in the same field of view. All the galaxies show a smooth appearance and are elongated. Three galaxies are very close to each other. Some minutes apart you can see NGC 7552 that also looks smooth and not so elongated.

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## Southern Interacting Galaxies (Continued from page 6)

Using a little higher magnification (53x) and observing in detail the group of three galaxies, NGC 7582, 7590 and 7599 (see picture below that I made using Aladin v2 software). You can see that NGC 7582, a SBab galaxy according to the Revised NGC Data by Wolfgang Steinicke, is the brightest member, and starburst activity is observed in this galaxy and also in NGC 7552. A very few faint foreground stars are visible superimposed on the galaxy NGC 7590.



On the other hand, NGC 7552, situated at about ....arc minutes from the interacting triple, looks more round in shape and with a brighter core. At 106x the view of this galaxy is excellent. You can clearly see its bright and small core and also its elongated and smooth disk. The core is better viewed at 156x. Again at 106x, a 12.9 magnitude star is visible just on the border of NGC 7590, the smaller galaxy of the quartet. Some bright spots seem to be present in the elongated galaxy NGC 7582 when you observe it using averted vision. The galaxy NGC 7599 looks a little bigger and with more smooth brightness.

### The Robert's Quartet. A Challenging Compact Galaxy Group

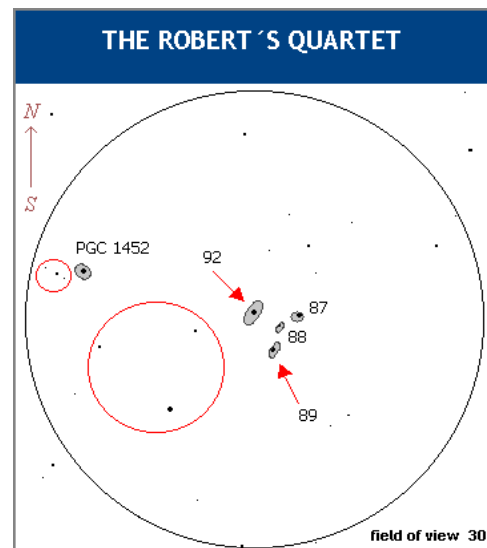
At the center of the constellation Phoenix (R.A 00h 22m 00s Dec -48.5 degrees), resides a small and faint group of four galaxies (NGC 87, NGC 88, NGC 89, NGC 92) discovered by John Herschel in 1830s and nicknamed "Robert's Quartet" after the astronomer Robert Freedman who generated many of the updated positions of galaxies in the Arp & Madore Catalogue. It is about 160 million light years from Earth. It is a group of four galaxies included in the NGC catalogue, NGC 87, NGC 88, NGC 89 and NGC 92.

It is classified as a category 4 "Interacting Quartets" in the **Catalogue of Southern Peculiar Galaxies and Associations** by H. Arp, B. Madore and W. Robertson (Cambridge University Press). I used a bigger telescope to observe this group, a 16-inch telescope observing at 72x.



To find this group was not easy because the galaxies are very small and faint. As shown in the eyepiece field picture (see below) I used some stars to recognize the zone where this small group lies. The triangle of stars, with magnitudes between 10.7 and 12.5, indicated with a red circle in the eyepiece field, is easy to identify and it is useful to use as a guide. Also the chain of three faint stars to the left in the field (also indicated with a red circle) was useful to find the extremely faint PGC galaxy.

Some members of the quartet are visible, NGC 89 and NGC 92, the brightest members with magnitudes 13.3 and 12.9. They look faint even in telescope of this size, like round and fuzzy clouds with smooth brightness. Being not a member of the group, the faint galaxy PGC 1452 is barely visible with averted vision like an irregular and smooth patch.



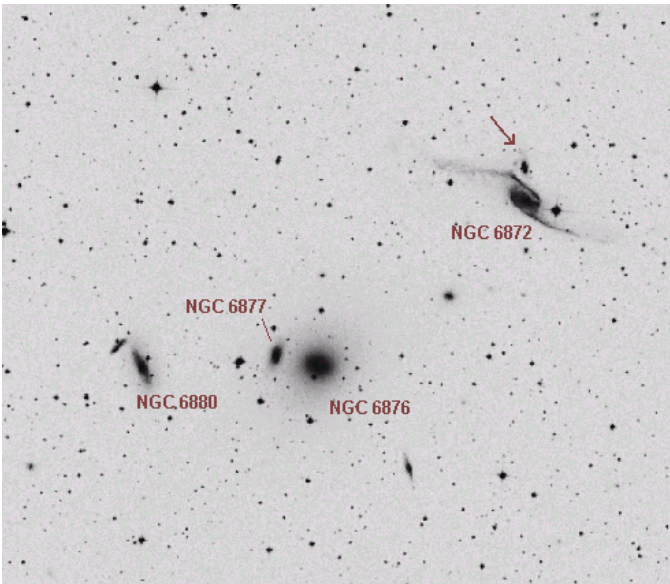
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Two Superb Cases in Constellation Pavo



NGC 6769/NGC 6770 is a good example of an interacting triple, with three galaxies of any type which appear disturbed. This group is very low in the southwest sky from here in December so I will observe it in detail in coming months and will include it in the second survey of this zone of the sky next year.

**The Pavo Group**



- NGC 6876 E3 Galaxy Magnitude 10.7
- NGC 6877 E6 Galaxy Magnitude 12.2
- NGC 6880 SB0-a Galaxy Magnitude 12.3
- NGC 6872 SAB(rs)c Galaxy Magnitude 11.7

In the eastern part of the southern constellation Pavo, about 180 million light years, you can find an interesting group of

galaxies named the Pavo Group. NGC 6876, an E3 galaxy, and NGC 6872 are the dominant members of this moderately massive and dynamically young group (see the paper: “A Multi-wavelength View of Star Formation in Interacting Galaxies in the Pavo Group” by M. Machacek et. al. published in The Cornell University e-library on October 20, 2008).

Observing this group with an 8-inch reflector working at low power (42x) the most prominent galaxy is the elliptical NGC 6876. Situated in a relatively rich starry field, it looks small and shows an increasing brightness toward its center. At this magnification, the galaxies NGC 6872 and NGC 6880 are very hard to see. They are barely visible using averted vision, like small and fuzzy patches.

Using higher magnification (78x), NGC 6876 looks a little elongated and may have an irregular shape. To the east, NGC 6880 is better viewed with a smooth brightness. NGC 6872, a gas-rich spiral galaxy which forms a tidally interacting pair with the spheroidal companion IC 4970 (indicated with an arrow in the picture above) and visible only in bigger telescopes. This pair is the VV 297 object (Vorontsov-Velyaminov). NGC 6872 is seen very close to the star of magnitude 10.4 TYC 9311-418-1. This faint galaxy also shows a smooth appearance.

I observed in detail the main galaxy NGC 6876 using higher magnification (148x). On its southeast border a star is clearly visible. This galaxy shows a little brighter inner part. Observing with averted vision, a star-like brightness much smaller than that shown in the picture to the left is visible for brief moments inside the most prominent part of the galaxy. The star-like brightness and the star on its border are indicated with arrows.

At first glance, the small galaxy NGC 6877 (to the left in the picture) was not visible. However, a more accurate observation made possible a glimpse of a very small, round (in spite of its classification as E6 galaxy) and faint cloud.



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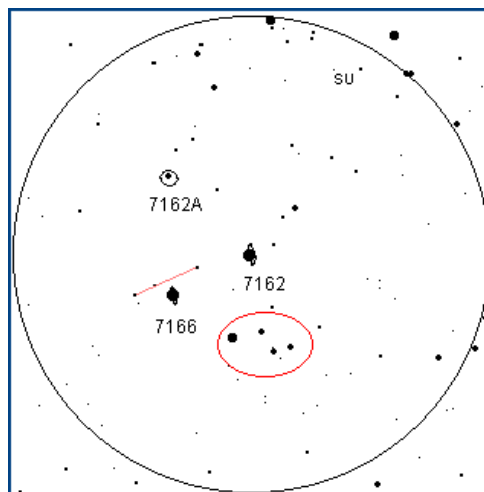
### Another Galaxy Group in Grus

There exists a group of galaxies in the southern constellation Grus, not too far from the pair NGC 7232/NGC 7233. That group is listed in the paper “**Dynamics of the Pavo-Indus and Grus Clouds of Galaxies**” by P. Fouqué et. al. The brighter members of the group are NGC 7162, NGC 7162A and NGC 7166. However, they are too faint to be observed through an 8-inch mirror working at low magnification.

To find the field where these galaxies lie was easy because you can see an asterism of four stars (red circle in the picture to the right). They are actually the brighter stars in an eyepiece field poor in stars. Once in the correct field, NGC 7166 is found without a problem using the line of three stars indicated with the red line. Working at low magnification (42x) this galaxy is seen as very small and faint.

Using the same eyepiece and a barlow lens, thus reaching

higher magnification (83x), NGC 7166 is easily seen, appearing more elongated and with a bright stellar-shape core. NGC 7162 is barely visible but it is there if you use averted vision.



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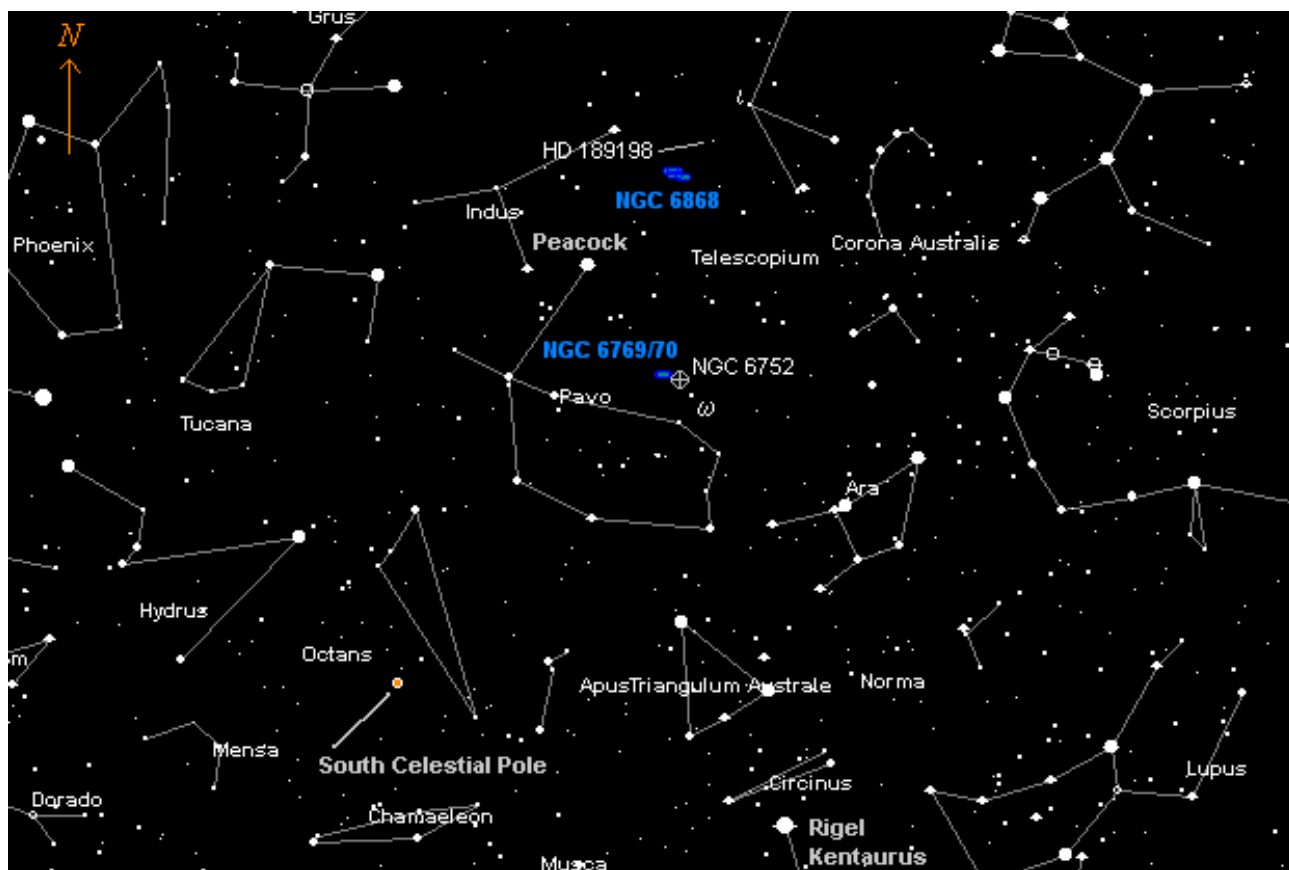
by Leo Cavagnaro

## Part 2. Galaxies in the Spring Southern Sky

On October, 16<sup>th</sup> I went to the mountains to continue with the observations of interacting galaxies, compact groups and galaxy chains I had begun at the end of last year. The reports below are result of the observations I made under a good sky, but not as good as other times in the same place. As I always say, it would be useful to observe these galaxies again under different conditions to compare results.

Last December 2008, I observed some groups of interacting-galaxies situated in some constellations which are home of this kind of objects (e.g. Pavo, Indus, Telescopium, Grus, Piscis Austrinus, Phoenix, Sculptor). In this article I have included reports and information about two groups situated in that area in the sky, namely the GR28 Cluster in constellation Telescopium and a galaxy triplet in Pavo.

### The Disturbed Galaxies NGC 6769, NGC 6770 & NGC 6771



Briefly mentioned in Part 1 of the article “**Interacting Galaxies in the Southern Sky**” appearing in the January 2009 issue of the Rosette Gazette, this small group of three faint galaxies lies in the beautiful constellation Pavo and this time was a target in my observing project because they are better viewed early in the night from here in October.

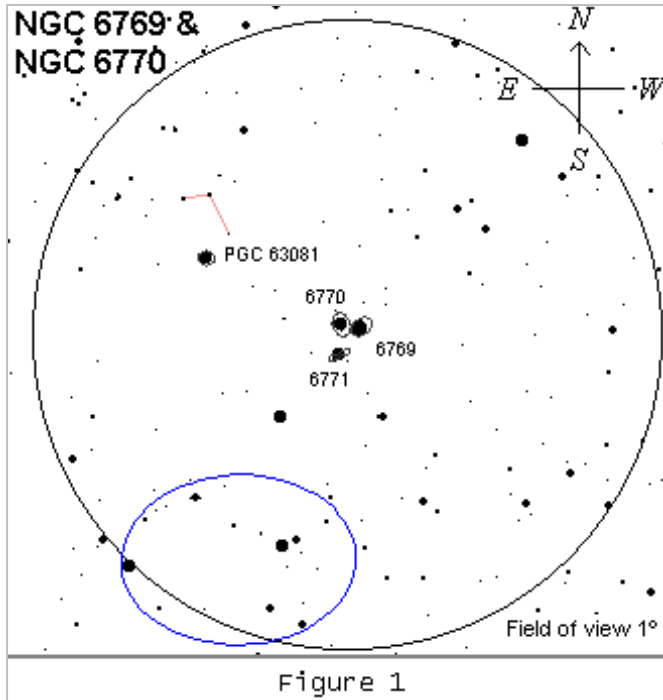
The observing site was again Villavicencio, a place with dark skies situated about 1,645 meters above sea level, about 31 miles north of Mendoza city.

NGC 6752 is a wonderful globular cluster (see map above)

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## Southern Galaxies *(Continued from page 3)*

situated in the north part of constellation Pavo (The Peacock). In my opinion, it is the third most impressive globular after 47 Tucanae and Omega Centauri. This 5.4 magnitude stellar swarm, visible to the naked eye as a faint fussy patch from very dark skies sites, is a neighbor of a small group of three galaxies situated only 1 degree southeast from it.

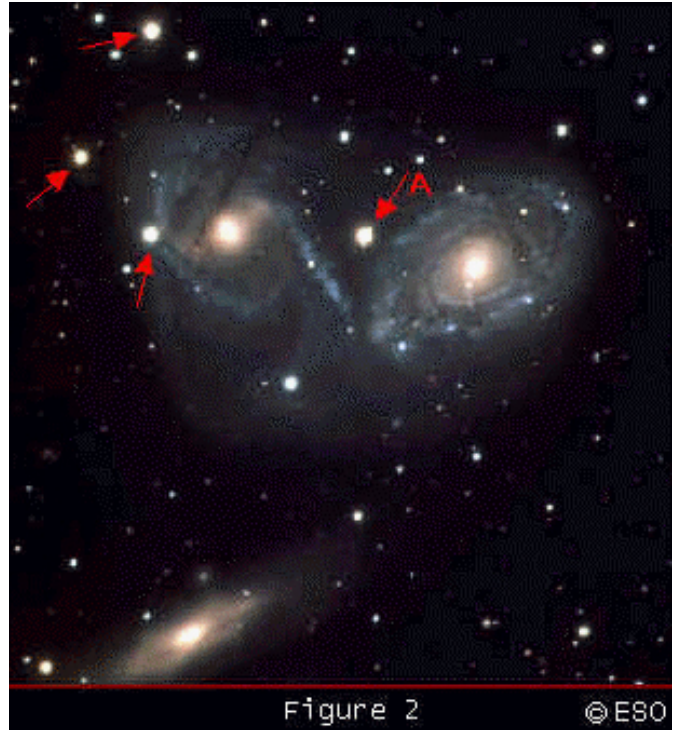


After aiming my telescope at this galaxy triplet I first observed it at low magnification (42x). A very faint and small nebulosity is visible in the region where these interacting galaxies lie. The field shows some relatively bright stars with magnitudes between 8.8 and 9.3 (the brightest in the field which are indicated by a blue ellipse in Figure 1). The pair NGC 6769/6770 looks like a single elongated nebulosity. The galaxy NGC 6771 is barely visible very close to the pair (about 3 arc minutes). Moreover, some very faint stars are visible in the zone of the pair engulfing it. This group is included in Category 3: Interacting Triples in “**A CATALOGUE OF SOUTHERN PECULIAR GALAXIES AND ASSOCIATIONS**” by H. Arp, B. F. Madore and W. Robertson as AM 1914-603.

On the other hand, the small and faint SBb galaxy PGC 63081 (also IC 4845, magnitude 11.9 according to Skymap Pro 6.0) is clearly visible even with direct vision to the northeast of the triplet appearing like a well detached little defocused star. I used the pattern of stars indicated with red lines in Figure 1 to find it.

The use of higher magnification (78x) made possible a better view of the stars surrounding the interacting galaxies. A pattern of four stars was easily identified (indicated with red arrows in Figure 2). This helped me to identify and observe in

detail both galaxies. To the right and very close to the star indicated by **A** in Figure 2 lies the brightest galaxy of the triplet, NGC 6769, an SBb/P galaxy according to the Wolfgang Steinicke's Revised NGC and IC Catalog. Through my 8-inch telescope this galaxy looks round and smooth in brightness. NGC 6770 looks fainter (mag 12.0, SB: 13.2 mag per square arcmin) and the barred galaxy NGC 6771 was very hard to see (higher magnification was necessary).



Using 106x the guide stars and each galaxies are better detected, specially NGC 6771 which is the fainter of the group with a magnitude of 12.6. Always averted vision improved the view.

With even higher magnification (148x) the elongated shape of NGC 6771 comes to the view easily using averted vision. Very close to this galaxy a small group of faint stars looks detached from the field.

### The Cluster GR28 in Telescopium

In the northeast part of constellation Telescopium lies a group of faint galaxies (e.g. NGC 6868, 6861, 6861D, 6851 and 6870) that belong to the cluster GR28 (see Figure 3). At least four (4) galaxies can be observed in the same eyepiece field of an 8-inch telescope when low magnification is used but higher magnification is necessary to see the faintest ones. Other small and faint galaxies with magnitudes around 14 are situated there (see DSS image in Figure 3) but a bigger mirror is necessary to see them.

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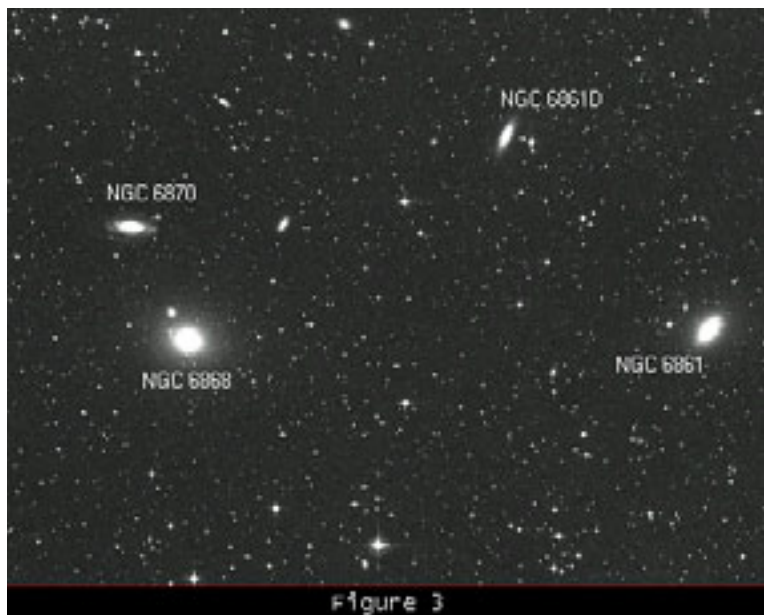


Figure 3

The pattern of stars indicated with the blue ellipse in Figure 4 was useful to find the major galaxy in the group, NGC 6868. Working at low magnification (42x) this elliptical galaxy was visible even with directed vision in an interesting star field appearing small, round and with a bright and sharp star-like core. The brightness of this galaxy drops outward. NGC 6868 is the brightest galaxy of the group. This is an elliptical galaxy (classified as E3 in RC3<sup>1</sup> and E2 by the Revised NGC/IC Catalogue).

Seemingly, the main source of gas ionization in this galaxy is non-thermal suggesting the presence of a LINER at the galaxy center (you can read more on NGC 6868 in the paper “**Star Formation, Metallicity Gradient and Ionized Gas: Clues to the Formation of the Elliptical Galaxies NGC6868 and NGC5903**” M.G. Rickes, M.G. Pastoriza and C. Bonatto Departamento de Astronomia, Universidade Federal do Rio Grande do Sul, Brazil February 2008). LINERs may be the weakest and most common manifestation of the quasar phenomenon, and can be classified as low luminosity Active Galactic Nuclei (LLAGN) “**LINERs AS LOW-LUMINOSITY ACTIVE GALACTIC NUCLEI**” (Luis C. Ho, Harvard-Smithsonian Center for Astrophysics).

According to Savage et al. (1977) it is also a radio source.

The stars GSC-8396-1362 and GSC-8396-0092 indicated with letter **D** in Figure 4 were used to easily find and identify NGC 6861 which was clearly visible at this magnification looking smaller than NGC 6868, round and with smooth brightness.

NGC 6870 was not visible at low power. Surrounding the position where this galaxy lies a line of stars is identified (marked with red lines in Figure 4). The very faint star **B**

(GSC-8396-0396 with a visual magnitude of 13.8) being barely visible with averted vision. At only 1.5 arc minutes from this star the galaxy should be visible but it was impossible at 42x. For very brief moments something seems to be visible but doubtless you need higher magnification in order to get a more clear view of this Sab type galaxy and make a detailed observation of it.

Another faint and small galaxy lies about 18.5 arc minutes northwest to NGC 6868, NGC 6861D which is the faintest member of the group. This E-S0 galaxy was not visible at 42x through an 8-inch telescope. However, you can use the 10.4 magnitude star TYC 8396-1542-1 (**C**) to find the accurate region where this galaxy is visible.

Observing the zone with higher magnification (83x) NGC 6868 is easily observed with its bright inner part. It resembles to me a small globular cluster with a low Shapley-Sawyer concentration class. The stars near NGC 6870 are better seen, specially the star **B**. This made possible the identification of NGC 6870 which was hardly detected. Averted vision was necessary to glimpse this galaxy. NGC 6870 is a good target to know how well your eye works when it is observed through an 8-inch telescope.

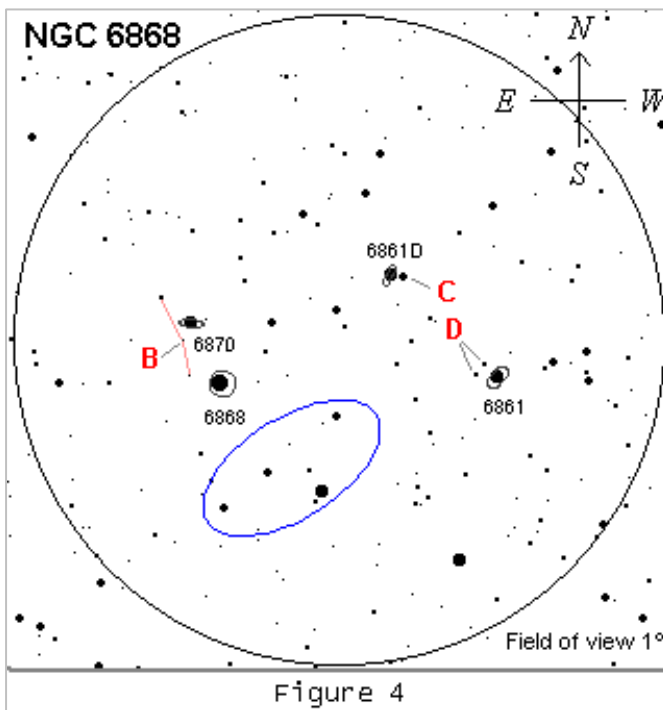


Figure 4

NGC 6861 is easier to see at this magnification appearing round at first glance. Observing carefully with averted vision the galaxy seems to have a little elongated shape.

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## *Southern Galaxies* (Continued from page 3)

On the other hand, NGC 6861D is at the threshold of visibility through an 8-inch telescope at this magnification. Very close to the star **C** is visible for moments with averted vision like a faint and small nebulosity. The overall shape was hard to determine, higher magnification is necessary to study this galaxy better.

A last observation of this group of galaxies at even higher magnification (106x) makes it possible to observe NGC 6870 with more details. It shows an elongated shape and smooth brightness. NGC 6861D was also visible with averted vision at 106x looking round in shape.



**This Article Is Dedicated To The Memory Of My  
Very Dear Mother, April 1939 - September 2009**

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# INTERACTING GALAXIES IN THE SOUTHERN SKY

by Leo Cavagnaro

## Part 3. A Compact Group, a Galaxy Chain and a Merging Pair

November 14, 2009 was the last night to observe a sample of interacting galaxies in the spring southern sky. This time I drove to a place named “Jocoli” from where I carried out other deep-sky objects observations. The site is situated about 40 miles north to Mendoza city.

With the 8-inch telescope set up, I spent some minutes enjoying the starry night with the unaided eye. The sky was clear but not exceptionally dark so the reports below are results of the observations made under those conditions.

The first hours of the nights in middle November are appropriate to observe galaxies because the view is far away from the dusty lane of our Milky Way. Constellations Piscis Austrinus (The Southern Fish), Sculptor and Aquarius are home of some galaxy groups that represent a challenge for observers with 8-inch mirrors, especially two groups situated in the western part of constellation Piscis Austrinus.

Piscis Austrinus and Sculptor are constellations visible from Oregon. They reach about 15 degrees of altitude in the sky looking toward the south for observers in Portland, so you could try to observe the galaxies from your observing site using a bigger mirror and compare results.

### The Compact Group Hickson 90

Situated in the western part of constellation Piscis Austrinus, whose brightest star (magnitude 1.2) is Fomalhaut, a group of galaxies is found which receive the number 90 in the list compiled in the nineteen-eighties by the Canadian astronomer Paul Hickson.

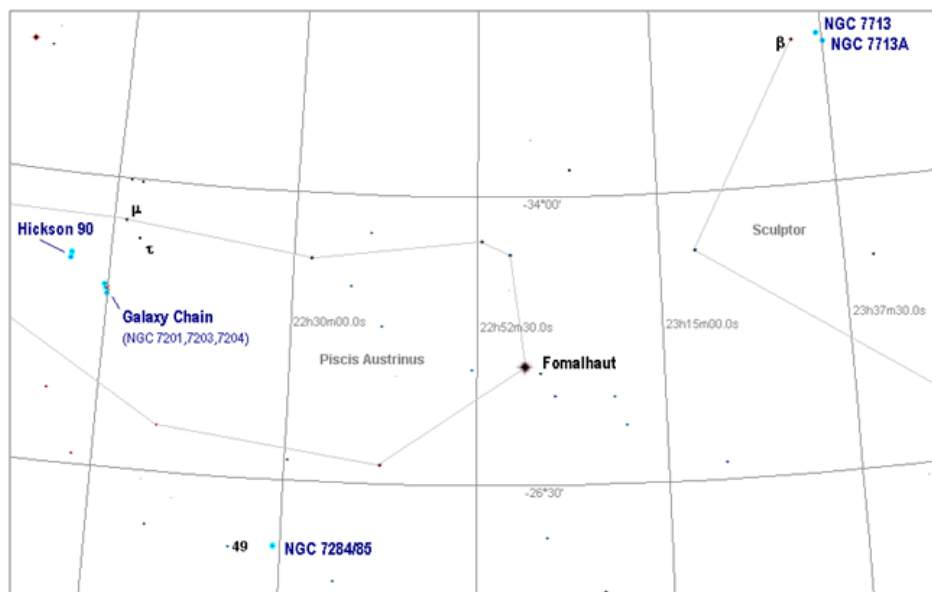
This compact group lies about 1.7 degrees from the 4.5 magnitude star  $\mu$  in Piscis Austrini which I used as a starting point to find it (see map in first page).

Hickson 90 is a group with four galaxies: two late-type galaxies NGC 7172 and NGC 7174, and two early-type galaxies, NGC 7176 and NGC 7173. Three of these galaxies are located in the core of Hickson 90 (see the paper “**Kinematics in Hickson Compact Group 90**” by Leonardo Castañeda-Colorado and Michael Hilker, both from the Sternwarte der Universität Bonn, Germany).

A first observation using low magnification (42x) shows a field with several stars fainter than magnitude 11. The star HD 209253 (magnitude 6.6) is the brightest one in the 1.2 degree eyepiece field. Using this magnification the galaxies NGC 7172, 7173 and 7176 were barely visible, with averted vision being necessary in order to get a better view of the triplet.

The pair NGC 7173 / NGC 7176 is visible more easily than NGC 7172 which was very hard to see. Observing carefully the appearance suggests the presence of the two galaxies. Higher magnification will decidedly allow you to get a more clear view of each member of the pair.

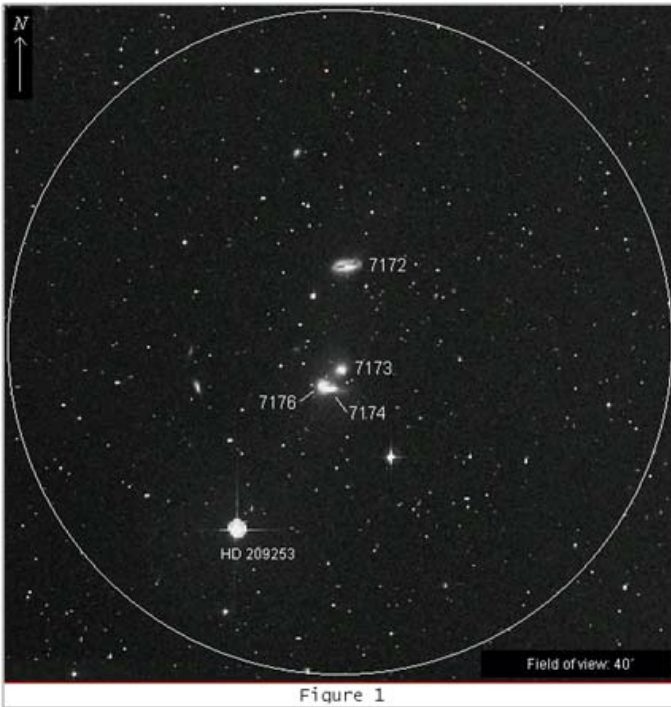
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The map shows the positions of galaxy groups in the southern constellations. November, early in the evening, is a good time to observe these faint patches of light.

## Southern Sky Galaxies (Continued from page 7)

NGC 7176, situated about 10 arcminutes from the star HD 209253 and at 6 arcminutes from HD 209137, one of the brightest stars of the field (9.3 magnitude) to the southwest of this galaxy, is the brightest and biggest member of the group, showing a seemingly star-like bright core. On the other hand, NGC 7173 looks smaller (SkyCharts and Skymap Pro 6 also give the denomination NGC 7174 to this galaxy) lying very close to NGC 7176 at only 1.5 arcminutes.



At 53x, the triplet is better seen and I was able to split and discern the galaxies NGC 7173 and NGC 7176 more easily, showing their nuclei or central regions like bright dots. As for NGC 7172, it was seen a little better at this power even if it was still hard to see, although I could glimpse its shape using averted vision with it appearing a little elongated and smooth in brightness.

I decided to use 78x which was a good magnification for observing the group. When I first saw NGC 7176 it appeared showing its star-like bright core. At this magnification a bright dot or stellar-like structure was seen very close to the nucleus. There is an elongated galaxy only 35 arcseconds from NGC 7176 named NGC 7174 (also HCG 90D, MCG -5-52-10, ESO 466-40).

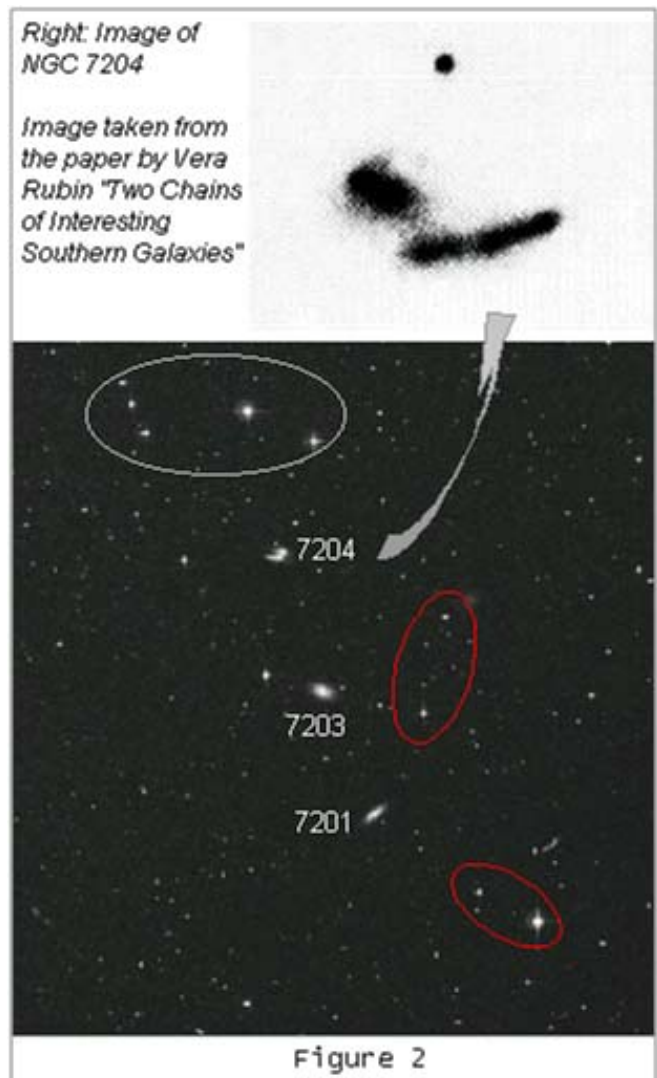
In regards to the other members, the core of NGC 7173 also looks stellar, however NGC 7172 has a smooth appearance and with a little bigger angular dimension.

A final observation at 196x made possible to observe the Sa type galaxy NGC 7172 with a smooth structure. NGC 7176 looks clearly elongated and with averted vision the core looks

not stellar but like a bright spot and the small structure near the core, fainter than this one, is visible. With averted vision NGC 7172 is larger than the other galaxies.

### A Chain of Faint Galaxies

After observing the compact group I turned my telescope to a place situated only 1.2 degrees apart, with the idea of observing an interesting chain of galaxies. This chain is formed by three NGC galaxies (i.e. 7201, 7203 and 7204). A faint galaxy is visible to the west in the DSS image, PGC 68026. Skymap shows NGC 7202, situated between NGC 7201 and NGC 7203, as an unclassified object. Nothing is visible in the DSS image where it lies.



I spent some minutes to find the chain at low magnification (42x), the stars indicated with a white ellipse in Figure 2 (where North is up) helped for a first approach to the accurate positions of each member. At this power the galaxies represent

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a challenge for an observer using an 8-inch telescope and were not clearly visible, so higher magnification was necessary.

Getting deeper into the group, at 53x I could identify the zone where the spiral galaxy (Sa) NGC 7201 lies using the stars indicated with red ellipses in Figure 2 because the imaginary lines that join the stars point to the zone where this extremely faint galaxy should be visible. Using averted vision I could glimpse a small hazy patch there. NGC 7203, situated between the stars TYC 7489-227-1 (mag 10.9) and TYC 7489-810-1 (mag 11.6) looked similar through my telescope at this magnification.

At 78x both galaxies are still very faint and represent a challenge. It was necessary to observe the zone for a long time using averted vision and to recognize the stellar patterns used as a guide to observe these members of the chain, both looking faint and round in shape.

A final observation at 106x made it possible to observe NGC 7201 and NGC 7203 a little better. The faint galaxy NGC 7204, situated 7 arcminutes north-northeast of NGC 7203 was not visible at these different magnifications and under the observing conditions that night. According to the now old paper **“Two Chains of Interesting Southern Galaxies”** by Vera Rubin (Department of Terrestrial Magnetism, Carnegie Institution of Washington, D.C.) NGC 7204 consists of a string of four or five emission knots (see top panel in Figure 2)

Both Hickson 90 and this galaxy chain were included as members 34 and 36 by Klemola (1969) in his list of groups of southern galaxies.

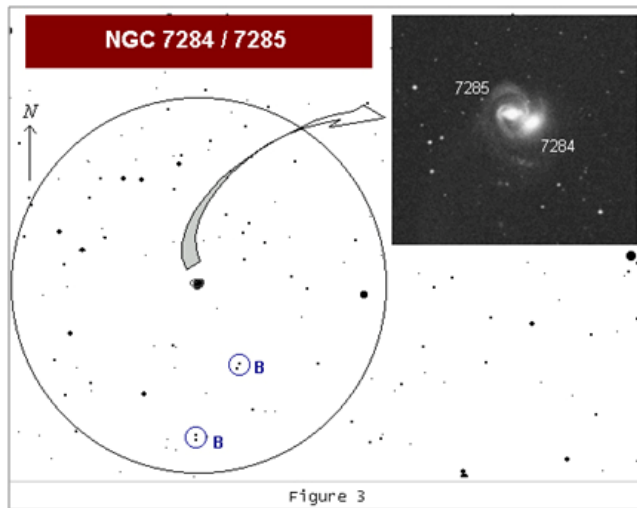
### NGC 7284/7285, a Merging Pair

These galaxies lie just on the border of constellations Piscis Austrinus and Aquarius. It seems to be a merging pair, appearing in Table 1 (p. 327) in the paper **“A Spectrophotometric Survey of Merging Galaxies”** by Charles T. Liu and Robert C. Kennicutt from Steward Observatory.

According to the Revised NGC Data, NGC 7284 is an SB0 galaxy with a magnitude of 12.0 and a surface brightness of 13.3 per square arcminutes. However NGC 7285 is seemingly a SBa galaxy with a magnitude of 11.9 and a surface brightness of 13.0 per square arcminutes. The pair is included in the well known Arp and VV catalogues with numbers 93 and 74 respectively.

Observing at 42x, the field shows several faint stars with magnitudes between 12 and 13. The pairs of stars indicated with letter **B** in Figure 3 were useful for me to locate the galaxies, especially the southernmost pair. The merging galaxies lie about 25 arc minutes straight North of this pair of 12.7 and 12.9 magnitude stars.

I began the observation of NGC 7284/85 when they were at an altitude of 30 degrees two hours before setting behind Los Andes mountains so they were observed under not favorable conditions. Observing carefully and using averted vision a very faint nebulosity could be seen at this magnification, round in shape and with a smooth brightness.



Higher magnification (78x) was necessary to observe the pair a little clearer and to try to observe details within, even if the target was still faint through my 8-inch. A more detailed observation applying averted vision made possible the identification of some brighter “points” or spots within, which were also viewed at 106x.

### A Galaxy Group near the Sculptor Group

Any atlas or sky chart will show NGC 253, the famous “Silver Coin Galaxy” and NGC 55 (this one plotted in Figure 4 where north is down), two bright galaxies that belong to one of the most known and nearest galaxy groups to our Local Group, the “South Polar Group” or “Sculptor Group”. Both galaxies are gems in the southern skies and are visible even with binoculars from dark sky sites. Situated in constellation Sculptor, this group also contains the interesting galaxies NGC 300 and NGC 7793 among others.

However, a less known group lies in the southwest corner of this faint constellation (composed by four stars with visual magnitudes of about 4.4) not far, in projection on the sky, to the Sculptor Group. This group is known as LGC 478 which contains the galaxies NGC 7713, IC 5332, ESO 347-17 and ESO 348-9. NGC 7713 (an SBcd galaxy) and its neighbor, the SBc galaxy NGC 7713A (seemingly not a member), are situated about 42 arcminutes from the star Beta Sculptoris (see Figure 4).

*(Continued on page 10)*

## Southern Sky Galaxies (Continued from page 9)

Besides these galaxies, there is a new galaxy, that appears to be a dwarf galaxy named **APPLES 1**, that would be a possible member of the LGC 478 group or, most probably according to some researches, just a field dwarf galaxy (read the paper “**Discovery of a Solitary Dwarf Galaxy in the Apples Survey**” by Anna Pasquali et. al., The Astronomical Journal, 129:148–159, 2005 January), **APPLES 1** is at a location, in galactic coordinates,  $l=348^{\circ}.5, b=-65^{\circ}.1$ . I have indicated this galaxy on the map (red dot in Figure 4). You can see this galaxy is very close, in projection on the sky, to the Grus Quartet, a group of four galaxies that are all visible through an 8-inch telescope (read the article “**Interacting Galaxies in the Southern Sky, Part 1**” appearing in the January 2009 Rosette Gazette). It is situated only 15 arcminutes from the Grus quartet’s galaxy NGC 7552.

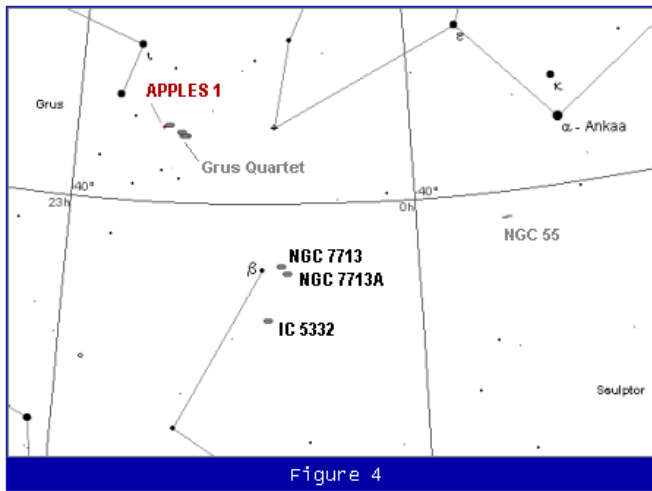


Figure 4

That night I observed NGC 7713 and its companion, NGC 7713A. I missed the chance to observe IC 5332, a SBcd galaxy with angular dimensions of 6 arcminutes (data by SEDS) or 8 arcminutes according to the Revised NGC/IC Catalog. At 42x, NGC 7713, the brightest member of LGC 478 galaxy group, is visible with direct vision even if the use of averted vision made possible to appreciate its elongated shape. On the other hand, NGC 7713A was not visible at all. The brightest stars in the eyepiece field (about 10th magnitude) lie toward the direction of Beta Sculptoris.

At 78x, NGC 7713 looks clearly elongated showing fainter ends which are noted in the DSS image of this object. The SBc type galaxy NGC 7713A was a faint object for my 8-inch telescope. For moments, “something” seems to be there after identifying the accurate zone using the 9<sup>th</sup> and 12.5<sup>th</sup> magnitude stars indicated with the red ellipse in Figure 5. New observations at higher magnifications (106x and 148x) did not guarantee that NGC 7713A would be visible in an 8-inch telescope observing under that sky conditions. Once again, a round and extremely faint nebulosity seems to be visible for moments, but without a doubt it is at the threshold of visibility.

The altitude of these galaxies at the time of the observation was about 35 degrees. New observations from different skies and at higher altitudes would be useful in order to compare results.

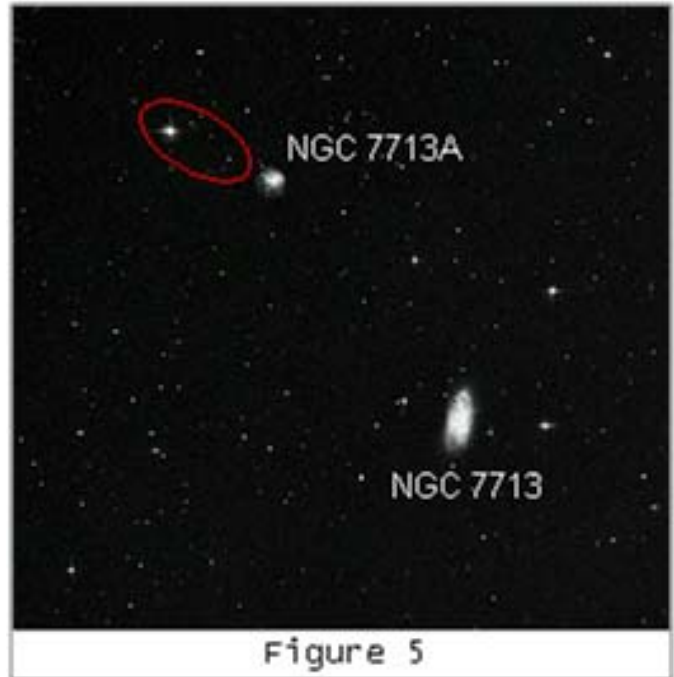


Figure 5

### Is NGC 7713A Visible Through an 8-inch Telescope?

#### A Brief Analysis of NGC 7713A Visibility Applying Optimum Detection Methods (ODM)

NGC 7713A was at the threshold of visibility (at least “at my threshold”) when I tried to find it under a good but not exceptionally dark sky, and with the galaxy at not a very good altitude (about 35 degrees). This is a low altitude if we take into account this galaxy reaches 85 degrees when it transits, the altitude being a very important factor among others like the sky conditions, the dark adaptation and the “aluminum coverage state of your mirror”.

If we take the values of magnitude and Surface Brightness from the Wolfgang Steinicke's Revised NGC and IC Catalog, mag:12.5 SB: 13.4 mag. per square arcminutes, this galaxy, according to the Clark's Method, should be visible under a 6.2 limiting magnitude sky even at low magnification (ODM=46x)

A new observation of NGC 7713A from an even darker sky and especially with the galaxy as high as possible would be necessary, and also checking if the values of the published magnitude are accurate for this object.

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