

Ellipticity of galaxies in Fornax cluster

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Abstract

This research is the studying about ellipticity of all 15 elliptical galaxies in Fornax cluster which is NGC 1339, IC 1919, NGC 1344, NGC 1374, NGC 1379, NGC 1387, NGC 1389 NGC 1427, IC 2006, NGC 1428, NGC 1399, NGC 1351, NGC 1404 and ESO 358-10 from PROMPT telescopes by using contour method and full width at half maximum technique, there are 3 E0-type galaxies 7 E1-type galaxies 3 E2-type galaxies and 2 E3-type galaxies

Introduction

Galaxies cluster is a group, cluster or super cluster of galaxies. Milky Way and nearby galaxies are in the Local group which is width at about 4 million light years. Milky Way has large Magellan cloud, small Magellan cloud and some dwarf galaxies as its natural satellite. The nearest galaxy cluster is Virgo cluster which is about 50 million light years away from Milky Way. Others galaxy clusters such as Coma cluster which has about 10,000 galaxies at 300 million light years away from Milky Way and Hercules cluster at 500 million light years away from Milky Way.

Fornax cluster is a galaxy cluster in Fornax constellation. It's about 62 million light years away from Milky Way. Fornax cluster is smaller than Virgo cluster and has 58 galaxies, 15 galaxies are elliptical galaxies, so I would like to research for the ellipticity of galaxies in Fornax cluster by using Hubble's galaxy classification. Hubble's classification divided galaxy into spiral, spiral bar and elliptical. Spiral galaxies are also divided as Sa Sb and Sc spiral bar galaxies as SBa SBb and SBc for the elliptical galaxies it has divided in 7 types, E0-E7.

Procedure

Acquire galaxies' images from the PROMPT 5 telescope at the Cerro Tololo Inter-American Observatory (CTIO), which has a field of view 10 arcminutes using an exposure time of 300 seconds in filter V. Use full width at half maximum technique (FWHM) to set contour then use ellipse tool of the SAO Image ds9 software to find major axis and minor axis of galaxies for use in Hubble's classification to classified galaxies

Find the ellipticity of galaxies by FWHM (Full width at half maximum) technique by set the contour line round the area that the value is half of the max value of the galaxy. Use ellipse tool to find major axis and minor axis of galaxy for Hubble's classification in this formula $10 \times \left(1 - \frac{b}{a}\right)$ (a is a major axis and b is a minor axis).

The result of Hubble's classification shows as the numbers from 0-7 the number represented the ellipticity of galaxy from less ellipticity to the most elliptical. This formula was created by Edwin Hubble, an American astronomer.



Image 1 elliptical galaxies type E0, E3, E5 and E7

Result and Discussion

Ellipticity of galaxies in Fornax cluster from SAOimage DS9 software by Hubble's classification show in the table

Type	Galaxy	Hubble's classification Result
E0	NGC 1374	0.1
	NGC 1379	0.2
	NGC 1387	0
E1	IC 1919	1.7
	NGC 1339	1.7
	IC 2006	1.4
	NGC 1427	1.8
	NGC 1399	1.3
	NGC 1382	1.1
	NGC 1404	1.3
E2	NGC 1389	2.5
	NGC 1428	2.3
	ESO358-10	2.4
E3	NGC 1344	3.2
	NGC 1351	3.3

Conclusion

There are 3 E0-type galaxies such as NGC1374, NGC 1379 and NGC 1387, 7 E1-type galaxies such as IC 1919, NGC 1339, IC 2006, NGC 1427, NGC 1399, NGC 1382 and NGC 1404, 3 E2-type galaxies such as NGC 1389, NGC 1428 and ESO358-10 and 2 E3-type galaxies such as NGC 1344 and NGC 1351.

From the table, Fornax cluster has no E4 type or more galaxies so Fornax cluster is a galaxy cluster that has less ellipticity galaxies.

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