

UNIVERSIDAD DE GUANAJUATO

CAMPUS GUANAJUATO

DIVISION DE CIENCIA NATURALES Y EXACTAS



Efectos del medio intergaláctico en la Evolución de Galaxias: Estudio
Multifrecuencia del Cúmulo Abell 85

Tesis presentada al

DEPARTAMENTO DE ASTRONOMÍA

como requisito para la obtención del grado de

MAESTRO EN CIENCIAS (ASTRONOMÍA)

por el

Lic. Juan Manuel Islas Islas

asesorado por

Dr. Héctor Bravo Alfaro

Guanajuato, Gto. Marzo 2007

Contents

1	Introduction	2
1.1	HI in cluster galaxies	4
1.1.1	The 21 cm line of atomic hydrogen	5
1.1.2	Overview of HI in galaxies	5
1.1.3	The VLA	7
1.1.4	Clusters imaged in HI	7
1.2	The Cluster of galaxies Abell 0085	11
2	A85 observations and data	16
2.1	HI observations of A85	16
2.2	Finding HI detections	17
2.2.1	Visual inspection	17
2.2.2	Signal to noise criteria	20
2.2.3	3-Dimensional behaviour of the detections	21
2.2.4	Optical counterparts	22
2.3	HI results for A85	22
2.4	Results on individual objects	25
2.5	Data obtained from the literature	35
2.5.1	Optical data	35
2.5.2	Spectroscopic	36
2.5.3	X-ray data	37
2.5.4	Near Infrared data	37
3	Analysis and discussion	38
3.1	Galaxy distribution in the A85/87/89 complex	38
3.2	Quantifying the degree of sub-structure in A85	44
3.3	The blue member galaxy sample	46
3.4	HI distribution in A85	52
3.5	Ram-pressure analysis	54
3.6	Spectral analysis and environmental effects	59
3.7	Galactic activity analysis	64
4	Summary	68