IS COMA A YOUNG AGGREGATE OF OLD SUBCLUSTERS ?

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EVOLUTION OF GRAVITATIONAL SYSTEMS IS CURRENTLY BELIEVED TO FOLLOW A 3-STAGE SCHEME: STAGE 1: SUBCLUSTERS FORM FIRST DURING VIOLENT RELAXATION
STAGE 2: DYNAMICAL FRICTION → MASS SEGREGATION
STAGE 3: CONTRACTION OF CORE, EXPANSION OF HALO

CURRENT IDEAS ARE THAT THE COMA CLUSTER IS AN ARCHETYPE OF A WELL RELAXED SYSTEM AFTER COMPLETION OF VIOLENT RELAXATION, **BUT** :

SUBSTRUCTURE STILL DOES EXIST IN COMA TOGETHER WITH STRONG LUMINOSITY SEGREGATION AND ANTI-SEGREGATION AT HIGH LUMINOSITY (Fitchett & Webster 1987, Valtonen & Byrd 1979, Capelato et al. 1980, Mellier et al. 1987) IS THIS EVIDENCE FOR BEGINNING OF STAGE 1 OR FOR END OF STAGE 2 ?

CROSS-IDENTIFICATION OF THE PHOTOMETRIC GODWIN, METCALFE & PEACH (1983) CATALOGUE WITH THE KENT & GUNN (1982) SPECTROSCOPIC CATALOGUE AND DETAILED ANALYSIS OF THE VELOCITY DISTRIBUTION IN COMPLETE SAMPLES SHOWS
1) IN THE CLUSTER CENTRE THE VELOCITY DISPERSIONS OF GALAXIES ARE :

BRIGHT	280±80 KM/S
INTERMEDIATE	1600±360 KM/S
FAINT	1180±170 KM/S

2) HISTOGRAM OF VELOCITIES WITH RESPECT TO THE BRIGHTEST GALAXIES IN THE COMPOSITE POPULATION OF SUBCLUSTERS GIVES A **SINGLE** GAUSSIAN FIT **REJECTABLE AT THE 95 % CONFIDENCE LEVEL**, BEST FIT NEEDS **TWO POPULATIONS** EXTENDING Cowie & Hu'S (1986) RESULTS TO CLUSTER SUBSTRUCTURE

OUR CONCLUSIONS : SUBCLUSTERS IN STAGE 3, WHOLE CLUSTER IN STAGE 1
LOW VELOCITY DISPERSION CORES MADE OF MASSIVE GALAXIES HAVE EJECTED INTERMEDIATE-MASS GALAXIES - THESE ARE NOW FORMING HIGH VELOCITY DISPERSION EXPANDING HALOES WHICH ARE MERGING - HENCE WE ASK IF HIGH M/L VALUES FOUND IN CLUSTERS COME FROM APPLYING THE VIRIAL THEOREM TO A POPULATION IN EXPANSION IN UNEVOLVED WHOLE CLUSTERS ?

J. Audouze et al. (eds.), Large Scale Structures of the Universe, 535.