ABSTRACTS

Session 66: Display Session Summary
1:45–2:45 (Room C-112)

66.01
Recent Progress in Understanding Phenomena in Cool Star Atmospheres Using High Resolution Spectroscopy & Monitoring Techniques

J.L. Linsky (JILA, NBS, U. Colo.)

Session 67: Public Policy Panel Discussion
2:50–4:20 (Civic Auditorium)

Session 68: Clusters of Galaxies
2:50–4:20 (Room C-112)

68.01
Giant Luminous Arcs in Galaxy Clusters

R. Lynds (KPNO/NOAO), V. Petrosian (Stanford U.)

We announce the existence of a hitherto unknown type of spatially coherent extragalactic structure having in the two most compelling known examples, the common properties: location in a cluster of galaxies, narrow arc-like shape, enormous length, and situation of center of curvature toward both a cD galaxy and the apparent center of gravity of the cluster. The arcs in excess of 100 kpc in length, have luminosities roughly comparable with those of giant E galaxies, and are distinctly bluer than E galaxies - especially so in one case. Interpretations of the nature of the arcs are discussed within the framework of available data.

68.02
Substructure in the Coma cluster

M. J. Fitchett (C.I.T.A., Toronto), R. L. Webster (U. Toronto)

The existence of substructure in the core of the Coma cluster is shown by the use of a new statistical method based on maximum likelihood. This method enables the galaxies to be split into two groups on the basis of their positions and line of sight velocities. The mean velocities of the two groups so defined are very close to the velocities of the D galaxies they contain, in accord with the suggestion that D and cD galaxies lie at the bottoms of potential wells. Dynamical models of the system are constructed and compared with other rich clusters exhibiting substructure.

68.03
The dynamics of the Corona Borealis supercluster

F. Postman (Princeton Univ.), G. J. Thomas (Harvard-Smithsonian Center for Astrophysics)

We have acquired new photometric and redshift data for 164 individual galaxies in the Corona Borealis (Cor Cor) supercluster. Initial results for the Cor Cor clusters lie in the range 1.6 - 7.5 Mpc. This beam ... band LASSO-light ratio within the central 1 kpc regions of these clusters is 247 ± 144. Using the mean luminosity density derived from the CfA redshift survey this h/L yields a value for the mean universal mass density of \( \Omega_d \approx 0.2 \pm 0.1 \).

These data allow a new limit to be placed on \( \Omega_c \) at supercluster scales if we assume galaxies trace the matter distribution. We find \( \Omega_c \approx 0.4 \) on 1–20 Mpc scale. The uncertainty in \( J_L \) is about a factor of 2, however. The supercluster mass is between \( 5 \times 10^{15} \) and \( 10^{16} M^\odot \). This is sufficient to bind the supercluster although it is unlikely to be a virialized system. Peculiar velocities within the supercluster are \( \approx 220 \) km/sec. It is probable that the observed elongation of Cor Cor in redshift space is partly spatial in origin.

68.04
A Search for Intergalactic HI Around Early-Type Galaxies

S. E. Schneider, T. X. Thuan (Univ. of Virginia), E. E. Salpeter, Y. Terzian (Cornell Univ.)

A large cloud of intergalactic neutral hydrogen was discovered four years ago in the N96 group of galaxies in Leo. This group is characterized by a large number of early-type (elliptical and lenticular) galaxies, and the intergalactic gas seen orbiting in a giant 200 kpc ring about an E and SO. An examination of galaxy groups accessible at Arecibo has turned up six similar groups that are dominated by E and SO galaxies. We are currently undertaking an HI mapping survey of these groups to determine whether intergalactic gas might be associated with early-type galaxies—which have otherwise received less study at 21 cm than their gas-rich counterparts. It is interesting that some of the galaxies in these groups have conflicting claims in the literature about the presence of neutral hydrogen, with claimed detections from small, large-beam radiotelescopes, but with non-detections reported when using Arecibo’s smaller beam. Such apparently contradictory claims would be resolved if, as in the N96 group, intergalactic gas surrounded the galaxies outside of Arecibo’s beam. We have selected eight additional individual E’s and SO’s with conflicting HI detections from the literature for additional mapping to search for surrounding HI. The results of a November 1986 survey of these potential regions of intergalactic gas will be presented.

68.05
Radio Observations of Central Dominant Galaxies in Cluster Cooling Flows

C. P. O’Dea (NRAO) and S. A. Baum (U Maryland and NRAO)

We combine new VLA observations of central dominant (cd) galaxies currently thought to be in cluster cooling flows with observations from the literature to examine the global properties of a heterogeneous sample of 31 cd galaxies. The sources tend to be of low or intermediate radio power (median power at 1.4 GHz is \( 10^{23.86} \) Watts Hz\(^{-1}\)). In fact, some sources are not detected at very low levels, suggesting that cooling flows do not necessarily result in the formation of powerful radio sources. The median projected largest linear size is \( \approx 25 \) kpc. Thus, the sources are contained within the densest, coolest portions of the cluster cooling flows. There is a wide range of radio morphology. The extended sources tend to have distorted or otherwise complex shapes (e.g., wide-angle tails, 'S' shapes, and 'vortex'—i.e., multiple bends). However, it is not yet clear whether the radio emission from these cd galaxies is significantly different from those not thought to be in cluster cooling flows.

We find no correlation of radio power with mass accretion rate or central electron density. We confirm the result of Jones and Forman that there is a possible correlation between radio power and excess X-ray luminosity in the cluster center (above a King model fit to the X-ray surface brightness).

A significant fraction of the flux density is contributed by high surface brightness structure (core, jets, knots) — i.e., there are not yet any...