

model the nature of the outbursts is so varied that a single, simple model cannot account for all their aspects. However it is noted that a few individual sources exhibit all the different variability characteristics at different epochs, thus suggesting that a unified model may yet be possible. Many of the sources have been studied with VLBI and their structures are investigated in relation to the observed variability. In particular the "cosmic conspiracy", in which individual components with complex spectra "conspire" to present a featureless flat spectrum, is re-examined.

"The Spatial Distribution of Galaxies", A.P. Fairall, University of Cape Town, Rondebosch, 7700 South Africa

Redshifts enable us to see the spatial distribution of galaxies in three dimensions. Thus we have established that our galaxy lies on the fringe of the Virgo supercluster - centred on the Virgo cluster 1000 km s^{-1} removed from us in redshift (velocity) space. Coma (6000 km s^{-1}) and Pisces-Perseus (5000 km s^{-1}) are two neighbouring superclusters, the intervening space being filled by a foam-like labyrinth of bubble voids. (At the conference, a three dimensional display - using plots from *Publ. Astr. Dept. Univ. Cape Town*, No. 8 - was available).

To the south, the Virgo supercluster is linked to the so-called "Hydra-Centaurus" supercluster - a dominant feature in the southern sky. However, percolation investigations fail to show a clear connection between the Hydra and Centaurus components. This has been done in two dimensions by da Costa *et al.* (*A.J.*, 91, 6, 1986), and in three dimensions by a collaboration between G. Vettolani (Bologna), G. Chincarini (Milan) and the author. For this investigation, the author obtained 180 new redshifts in Hydra-Centaurus using the SAAO 1.9m Radcliffe reflector; the telescope with RPCS detector is ideally suited for such redshift work.

While the Centaurus supercluster does not have a strong connection to Hydra, it does link to the Pavo supercluster - though the link is obscured by the crossing of the Milky Way. The author has carried out a redshift survey of the Triangulum Australe-Ara region which lies on the line between Centaurus and Pavo, but at very low galactic latitude. Using 31 old and 56 new redshifts obtained at S.A.A.O., plus a further 43 from the literature, a conspicuous excess is found at 4500 km s^{-1} . This confirms an earlier suspicion that Centaurus and Pavo are one and the same supercluster.

"Symbiotic Miras", P.A. Whitelock, South African Astronomical Observatory, P O Box 9, Observatory 7935.

Symbiotic miras form a subgroup of the general class of symbiotic stars. They appear to be interacting binary systems in which a mira transfers mass to a compact object via its stellar wind and an accretion disk. Observational data covering the spectral region from X-ray to radio are reviewed with particular reference to IRAS and new near-infrared results. 11 of the 25 potential members of this class have had their pulsation periods determined, thereby confirming their mira nature. The pulsation periods range from 280 to 580 days and imply a progenitor mass for the mira slightly greater than $1M_{\odot}$. The mira period-luminosity relation is potentially useful for distance determination; however, dust obscuration presents a problem for its

application. The importance of determining orbital periods is emphasized although this may prove difficult as they will be in (perhaps considerable) excess of 20 years.

"A Search for QSOs in the Fields of Nearby Galaxies", A.S. Monk, M.V. Penston, M. Pettini, Royal Greenwich Observatory, Herstmonceux Castle, Hailsham, East Sussex, BN27 1RP, England and J.C. Blades, Space Telescope Science Institute, 3700 San Martin Drive, Homewood Campus, Baltimore, Maryland 21218, U.S.A.

The aim of our programme is to use the absorption spectra of QSOs and related objects (BL Lacs, Seyfert galaxies) as probes of the interstellar media of intervening galaxies. For such a study it is necessary to find suitably bright QSOs and related objects lying close on the sky to large galaxies.

Since 1981 we have been carrying out a large scale search programme using UK Schmidt Telescope objective prism plates taken specifically for this purpose. Because we are looking for objects bright enough for high dispersion spectroscopy (>17.5 mag(B)), short exposure prism plates have been taken for us to a limiting magnitude of ≈ 17.5 : on sky limited exposures, such bright QSOs are saturated and harder to identify. We have searched several fields and have taken follow-up low resolution slit spectra of candidates, for confirmation purposes, using the 74-inch reflector at the South African Astronomical Observatory.

A programme of high-resolution spectroscopy has commenced on the Isaac Newton Telescope (La Palma) to search for interstellar CaII lines associated with the foreground galaxies to a detection limit of $40\text{m}\text{\AA}$ in equivalent width. This is an important forerunner programme to Hubble Space Telescope studies of the stronger ultraviolet lines.

Wednesday 4 February, 1987. 2nd Session. C.A. Engelbrecht, Chairman.

"Radio Variability in BL Lacertae Objects", D.C. Bramwell, HartRao, P O Box 3718 Johannesburg 2000.

A program to monitor the short timescale variability of 120 BL Lac objects (declination less than 21 degrees) at 2.3, 4.8 and 8.4 GHz has been in progress since late 1982. Flux density measurements are made at daily to monthly intervals, depending on the variability and flux of the source. Since the program started, a number of sources have been reclassified by other investigators, so that now only about 70 sources are classified as BL Lac objects.

Approximately 25% of the objects have shown flux variability, with flux changes of from 10% to more than 100%, and time scales from weeks to years. About 80% of the variable sources are classed as BL Lac objects. Bulk relativistic motion in jets close to the line of sight is required for the stronger variables.

The shape and spectral evolution of the outbursts are discussed in terms of current jet and beaming models. Many of the flux changes in the sources can be described as resulting from disturbances propagating in a jet, or by some modification to the canonical model. However, each outburst requires different parameters to characterize its exact form. Superposition of flares occurs frequently.

Some unusual behaviour in the spectral evolution of the variability in 0851+20 (OJ287) and the extreme variable PKS 1144-379 are discussed in more detail.