32.11
Superluminal Resupply of a Radio Lobe in 3C395

J. H. Spencer, J. A. Waak, K. J. Johnston, and R. S. Simon (NRL)

Second epoch (1983.26) measurements of the milliarcsecond structure of the radio emission of 3C395 at 5 GHz have been made. The map is similar to that at epoch 1979.93 and is dominated by two components: a compact component and a resolved lobe separated by 15.6 mas along a position angle of 118 degrees. In 1983.26, however, a component is detected 3.9 mas from the core, also at a position angle of 118 degrees. Reanalysis of the 1979.93 data shows the compact component to be double with a separation of 2.6 mas along position angle 118 degrees. If these new third components in the 1979.93 and 1983.26 maps are identified as the same component, then this new component is moving toward the apparently stationary radio lobe at an apparent speed of approximately 11c. This result, if confirmed, would make 3C395 the first source to display superluminal resupply of a radio lobe.

32.12
Constaints on Bent Beams in Narrow Angle Tail Radio Sources

Christopher P. O'Dea (NRAO)

Constaints on the momentum and energy flux in bent radio-luminous plasma beams are examined. General expressions are given for the bulk velocity, particle density, and efficiency of conversion of energy flux into radio luminosity. VLA data on the intensity ratios of opposing jets in a sample of Narrow Angle Tail (NAT) sources are used to set an upper limit of 0.2c to the bulk velocity of the beams. Within the context of current models for NATs, order of magnitude estimates are made for the parameters of the beams in 19 NATs. The beams tend to have velocities of $\sim 10^4$ km s^{-1}, densities of $\sim 10^{-4}$-10^{-6} cm^{-3}, efficiencies of $\sim 10^{-1}$-10^{-3}, and mass loss rates of $\sim 10^{-1}$-10^{-3} $M_\odot$ yr^{-1}. Plasmons in a channel in an interstellar medium in the parent galaxy tend to be slower, denser, less efficient, and have higher mass loss rates than beams in sources of similar luminosity and morphology.

32.13
A Digital Surface Photometric Study of NGC 5128

R. L. Pennington (U. Minnesota)

A set of 13 excellent CTIO 4m prime focus plates were digitized (1 pixel=1".40), calibrated to the standard UBV passbands and coadded to produce 512 x512 pixel UBV rasters. The rasters were studied using image processing techniques.

The dust lane was found to be an annulus with inner and outer radii of 2.2(D/3) and 2.6(D/3) kpc, respectively, a height of 0.7(D/3) kpc and an inclination of 80±2 degrees to the plane of the sky. Star formation is most intense on the northern edge of the near side and the southern edge on the far side of the lane. The minimum mass of the lane has been estimated from visual extinction measurements to be 10^8 $M_\odot$. The dissimilarity of the NW and SE parts of the lane suggests that the lane is subject to infall on the northern edge of the SE part of the lane, estimated to be about 1 $M_\odot$/year.

The elliptical main body of the galaxy has colors slightly bluer than a "normal" elliptical, $(U-B,B-V)_o=(0.41\pm0.04, 0.87\pm 0.04)$ to r=2.6(D/3) kpc. Beyond this radius, a U excess is discernible. The coincidence of the radius at which the excess appears with the outer radius of the dust annulus suggests that the excess is due to [OII] 3727 Angstrom line emission from a hot gas that was originally part of the dust lane.

A careful subtraction of the elliptical galaxy light has clearly confirmed the existence of an inner optical jet. The optical knots are coincident with several reported X-ray knots. The jet is paralleled on both sides by dust obscuration from its point of detection near the lane to beyond the extent of the jet. No counterjet was detected to the SW of the nucleus.

32.14
Spatially-Resolved High-Velocity Outflow from the Nucleus of M51

G. Cecil (Inst. for Astronomy, U. of Hawaii)

Observational attempts to unravel the dynamical state of high-velocity gas in active galaxy nuclei have been frustrated by an inability to spatially resolve the emission regions. To circumvent this limitation, I am studying the nuclear region of the nearby spiral galaxy M51, which exhibits emission spectra characteristic of a low-luminosity Seyfert over a spatially extended region of ~16" diameter. This spatial extension affords a unique opportunity to examine in detail the energy flows in an active nucleus. Cecil & Rose (Ap.J. 289, 000) have established that a substantial fraction of the emitting gas in the nuclear region is expanding outwards at speeds in excess of the nuclear escape velocity. Ford et al (1984 B.A.A.S. 16, 458) found that the optical and radio-continuum emission peaks ~4" S of the nucleus in a well-defined extranuclear cloud. I have mapped the [NII] and [SII] line profiles across a substantial portion of this feature with 95 km/s velocity and sub-arcsecond spatial resolution. Although the profiles vary in a complex fashion, they can be decomposed into distinct Gaussian components whose velocity centroids and dispersions remain fixed across the cloud feature. While this decomposition is non-unique and has little dynamical basis, it does provide a convenient parametrization upon which to build a dynamically consistent and detailed interpretation of the nuclear energy flows. Preliminary results of this analysis will be presented.

32.15
Radio Structure of the Elliptical Galaxy MCG 5-4-18

J.M. Wrobel (OVRO/Caltech), R.S. Simon (NRL)

The 90-cm continuum emission from the elliptical galaxy MCG 5-4-18 (0116+319) was mapped with a seven-station VLBI array. The emission shows a triple structure extending for ∿ 0.15 arcsec (160 pc) along position angle ∿ 110 degrees. VLBI observations at 18 cm are planned to obtain spectral indices of these three components. A total radio spectrum is presented, and the case for its steep-spectrum nature, claimed by Peacock and Wall, is assessed. The nuclear activity in this elliptical galaxy, as manifested by its radio and optical line emission, may be triggered by an interaction with its close binary companion, MCG 5-4-17.

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32.16
Companions of Radio Elliptical Galaxies

K.A. Kingham (USNO)

A sample of elliptical galaxies associated with extended radio sources has been studied with both radio and optical techniques. Short exposure plates with large plate-scales