

exceeds 180 degrees. The fact that there are no systematic differences between the position angles observed at the three frequencies rules out mechanisms such as Faraday Rotation and synchrotron self-absorption as causes of this observed rotation. The large range of the position angles appears to require an explanation which invokes an apparent rotation of the magnetic-field orientation in the radiating region. This research was supported in part by NSF Grant #AST 7824192.

37.11.10 Analysis of the Distribution of Interstellar Dust Clouds in Messier 83, R. J. TALBOT, Jr. and B. GANZEL, Rice Univ. -- We discuss the sizes and positions of dark patches in M83 which are interpreted as dust clouds or cloud complexes. These were measured from ultraviolet, blue, and red plates from the CTIO 4-m telescope. We present analyses made of the radial variation of number density (clouds  $\text{kpc}^{-2}$ ) and cloud size. The relationships between positions of dust clouds and bright HII regions are examined and discussed in terms of mechanisms which may be involved in star formation.

37.12.10 Two Color Photoelectric Photometry of the Optical Halo Surrounding the Spiral Galaxy NGC 4565, G.L. GERBER and D.J. HEGYI, U. of Michigan.--Rotation curves of the edge-on spiral galaxy NGC 4565 imply a total mass which is greater than the mass inferred from optical observations of the disk and bulge. To further investigate the relationship between the unseen mass and the optical halo surrounding the galaxy, which we detected earlier (1977) in broadband photometric observations, we have undertaken additional observations in the R and I (Kron) photometric bands. For these measurements, we have modified the annular scanning photometer to interchange filters every ten seconds to minimize the effects of atmospheric variability. We have measured the halo surface brightness in both bands to signal levels of less than 0.1% of the sky brightness. The halo is detectable beyond a galactic radius of 35 kpc in our scan path. In the data reduction, special attention has been given to a number of systematics including sky gradients, telescope effects, and light scattered by field stars and by the bulge and disk of NGC 4565. We shall present color data for scan paths that extend to 100 kpc from the galaxy.

37.13.10 High Resolution 21 cm Study of An extremely Faint Dwarf Galaxy in the M81 Group. K. Y. Lo, W. L. W. Sargent, Caltech; R. Sancisi, Kapteyn Lab., Groningen - We have detected a previously uncataloged, extremely faint, dwarf irregular galaxy in the M81 group, with an absolute magnitude of only  $M_V = -9^m$  and a mass of  $\sim 10^7 M_\odot$ . The object has been observed with the Westerbork telescope at 21 cm. The neutral hydrogen is distributed in the form of a lumpy ring with a diameter of 2 Kpc and surrounding the visible galaxy. The measured projected rotation amplitude lies along the major optical diameter but is only  $2.5 \pm 1 \text{ Kms}^{-1}$ . This faint dwarf galaxy is probably the first gas-rich galaxy to have been discovered which is supported by turbulence and not by rotation. Most of its mass is in the form of neutral hydrogen. The dynamical properties of this faint dwarf galaxy raise interesting theoretical problems.

37.14.10 Extended 20  $\mu\text{m}$  Emission from the Center of NGC 1068. C.M. TELESKO, E.E. BECKLIN, and C.G. WYNN-WILLIAMS, Inst. for Astronomy, U. Hawaii - We present multi-aperture observations of the center of the Seyfert galaxy NGC 1068 which demonstrate that ~20% of the 20 $\mu\text{m}$  flux originates in a region of diameter  $\geq 6''$  (530 pc at 18.1 Mpc). The importance of this result is that it implies that a substantial fraction of the very strong far-infrared luminosity of NGC 1068 originates in a region much larger than the optically bright nucleus. We show that it is very difficult to account for this extended emission solely in terms of dust grains heated from a powerful compact object at the nucleus; we therefore conclude that energy production, perhaps in the form of new stars, must extend over an area of order 1 kpc in diameter. The observations were made by using three different sized telescopes on Mauna Kea, namely the 0.4 and 2.2 m University of Hawaii telescopes and the 3 m IRTF telescope. By using the identical instrumentation to compare repeatedly the flux from NGC 1068 with that of the star  $\alpha$  Ceti the effects of diffraction and seeing variations were minimized. This research was supported by NASA contract NASW 3159 and NSF contract AST 78-26028.

37.15.10 The High Velocity Material in NGC 1275, R. G. HIER, U. C. San Diego, and J. R. P. ANGEL, Steward Obs., U. of Ariz. We have obtained CCD and photographic images of NGC 1275 in the high velocity H $\alpha$  emission and the ultraviolet continuum below about 3500 Å, respective-