

Previous studies of the maser emission have considered molecular gas in α -disk models. The location of the inner radius of the masing annulus was assumed to coincide with an invoked disk warp, so that X-rays from the AGN continuum source could penetrate the gas and induce water production. In the case of NGC 4258, self-consistent calculations were made to identify the requisite disk parameters most conducive to the onset of masing conditions. Such disks, however, appear to require nearly ideal mass-to-energy conversion efficiencies to reconcile the observed radiated luminosity with the low inferred accretion rates.

We propose an alternative scenario in which the maser flux arises from dense clouds embedded in a magnetized accretion disk wind. Gas and dust lifted by the wind from the disk surface provides an effective radiation shield from the central continuum source, inducing optimal conditions for maser emission within the clouds. In this scheme, the location of the inner edge of the masing annulus is closely related to the dust sublimation radius, where significant radiation shielding commences. Because of the highly stratified density in the wind, shielding is greatest near the disk surface (where the velocity profiles are nearly Keplerian) and rapidly declines at higher latitudes, confining the masing gas to an effective disk-like configuration. Our disk wind model is consistent with observational evidence that the central engines of both NGC 1068 and NGC 4258 are obscured from our direct view and eject high-velocity outflows from their cores.

4.03

HST Planetary Camera 2 Imaging of the Nuclei of the Low-Luminosity, Late-Type Spirals NGC 4242 and NGC 4395

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Low luminosity, late-type (Scd-Sm) spiral galaxies sometimes contain compact nuclei which appear semi-stellar at ground-based resolutions. Studies of the nature of these nuclei and their relationship to the active nuclei in more luminous galaxies can be undertaken through the use of high-resolution imaging capabilities of the Planetary Camera 2 (PC 2) on the *Hubble Space Telescope*. Here we present a comparative study of the nuclei of the low-luminosity, late-type spirals NGC 4395 (SAdm) and NGC 4242 (SABdm) using new *HST* PC 2 images in the F450W and F814W filters in combination with existing multiwavelength data from the literature. The nucleus of NGC 4395 was discovered by Filippenko & Sargent (1989; ApJL 342, L11) to be the lowest luminosity Seyfert 1 known. Our new data confirm the existence of slightly extended emission (probably [O III]) first noted by Filippenko *et al.* (1993; ApJL, 410, L75) as well as a large filament associated with a possible bi-polar structure. The nucleus of the non-active galaxy NGC 4242 remains a near-stellar object in our PC 2 data. We discuss these results in terms of the starburst and AGN models for the activity in NGC 4395.

4.04

High Angular Resolution Imaging of the Nucleus of NGC 1068 at 10 Microns

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We have imaged the nuclear region of the Seyfert Galaxy NGC 1068 in the 10 μ m region, using the JPL-developed 10 μ m camera, MIRLIN, on the 5-m Hale telescope at Mt. Palomar. MIRLIN uses a 128 $\times$ 128 Si:As IBC array provided by Rockwell. The large well depth of the individual pixels allows observations to be made with high throughput and broad spectral bandwidths. For the observations of NGC 1068, the pixel size was 0.15 arcsec, and images were obtained at 8.8, 10.3, and 12.5 μ m [bandwidth $\sim$ 1 μ m]. At each wavelength, the observed shift-and-added image shows a definite N-S elongation. Images of the standard stars α Tau and β And were obtained at all three wavelengths and used for flux calibration and to establish a PSF template for deconvolution. The images were deconvolved using a Bayesian estimator which provided superresolution from the incorporation of prior information consisting of a positivity constraint. The independently obtained and deconvolved images are essentially identical at the three wavelengths, showing a bright $\lesssim 0.2 \times 0.6$ arcsec central core with its long axis in the N-S direction, embedded in a narrow ridge of emission which is elongated

by about 1.5 arcsec in the N-S direction but is less than 0.5 arcsec in E-W extent. Lower surface brightness emission is seen at each wavelength to the N-E of the central core. The results will be compared with HST images of the core of NGC 1068 and with theoretical models for the size and appearance of the source in the thermal infrared.

This work was carried out at the Jet Propulsion Laboratory, California Institute of Technology, under contract with the National Aeronautics and Space Administration.

4.05

The Extended Gaseous Medium Surrounding Markarian 315

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Markarian 315 (II Zw 187) is a classical Seyfert (1.5) galaxy. It has an unusual, narrow, filament of ionized gas extending roughly 65 kpc h^{-1} from its center towards the NW. We have mapped the HI associated with Markarian 315 using the VLA in the C-array and find it is located in a 60-100 kpc h^{-1} filament which is displaced by 60 kpc h^{-1} to the SE of the galaxy nucleus. The velocities of the neutral (HI) gas are interleaved with those of the ionized gas in the main body of the galaxy and those in the ionized filament. This close association between the ionized and neutral gas velocities suggests that the surrounding gas is interacting with the galaxy but the disjoint morphology of the ionized and neutral gas implies that the interaction must be complex.

4.06

Radio Continuum Mapping of the Spiral Galaxy NGC 4258

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We have combined numerous, short radio continuum observations of the Seyfert 1 galaxy NGC 4258 (M 106) made at 20 and 6 cm with the Very Large Array (VLA) to produce deep radio maps at these frequencies. These observations were originally taken for monitoring the radio supernova SN 1981K (Weiler *et al.* 1986, ApJ, 310, 790; Van Dyk *et al.* 1992, ApJ, 396, 195). The present analysis is analogous to our recent work on NGC 6946 (Hyman *et al.* 1993, BAAS 25, 1322) and on NGC 4321 (Hyman *et al.* 1994, BAAS 26, 1498) using observations taken for monitoring SN 1980K and SN 1979C, respectively. The maps we produce for NGC 4258 are of superior sensitivity ($\sigma \lesssim 0.02$ mJy/beam at 6 cm) and spatial resolution ($\sim 0.5''$ at 6 cm) to those previously published by other investigators (e. g., Turner & Ho 1994, ApJ, 421, 122; Cecil *et al.* 1995, ApJ, 452, 613). We present preliminary measurements and analyses of the nuclear region, the anomalous arms, and of detected thermal and nonthermal sources throughout the galaxy. We also make comparisons of our radio maps with existing data at other wavelengths and with the results of our analyses of NGC 6946 and NGC 4321.

4.07

Comparing the Position Angle of Seyfert Galaxies Radio Structures with their Host Galaxies Major Axis

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We analyze the difference between the position angles of extended radio structures and host galaxy major axis of Seyfert 1 and Seyfert 2 galaxies. We find that Seyfert 1's are less likely to have extended radio structures in the host galaxy major axis, while in Seyferts 2 these structures are distributed along all directions. These results are analysed from the point of view of a model in which Seyfert 1's have their obscuring torus axis aligned preferentially along the host galaxy disk axis, and Seyfert 2's have their torus axis laying at an intermediate angle between the galaxy disk and its axis.