

addition, $^{12}\text{CO}(2-1)$, $^{13}\text{CO}(1-0)$ and $^{13}\text{CO}(2-1)$ lines at a number of positions have also been observed.

The SMC CO clouds show that the $^{12}\text{CO}(1-0)$ line width ΔV is proportional to $R^{1/2}$ for a large range of radii R as for galactic molecular clouds. However, the relation between the CO luminosity and ΔV or the virial mass M_{vir} are different in the SMC and in the Galaxy. The SMC CO clouds at the smallest scales that we can resolve are less luminous in CO than galactic molecular clouds of the same size by a factor of a few, while at larger scales they are less luminous by a factor of 20. For two CO clouds in which the four lines were observed, we have derived their physical properties. These clouds are associated to H II regions and they show a clumpy nature and a higher kinetic temperature than the CO clouds associated to the Orion nebula in our Galaxy.

The results obtained can be explained by a higher photodissociation of CO in the SMC due to the higher UV radiation field and the lower abundance of carbon. In the SMC, contrary to the Galaxy, CO is concentrated in localized dense regions, which at larger structure sizes, contain a smaller fraction of the gas mass. On the largest scales, most of the interstellar hydrogen associated to the CO emitting complexes could be atomic rather than molecular. Assuming virial equilibrium for the CO structures we derive a preliminary estimate of the calibration coefficient for calculating the total column density of gas $N(\text{H}_2 + 2\text{H})$ from the $^{12}\text{CO}(1-0)$ line intensity $I(\text{CO})$. This coefficient X_{SMC} is larger than the canonical galactic value and depends on the scale R .

VLBI OBSERVATIONS OF 3C273 AND 3C279

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We present the time evolution of the superluminal sources in 3C273 and 3C279 at 10.7 GHz. In each case new components are associated with bursts in the total flux density observed at higher frequencies.

OPTICAL SPECTRAL CHARACTERISTICS OF THREE AGN CANDIDATES

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Observations in the optical range of the warm *IRAS*

galaxies I 0230+0012, I 0323-6054 and I 2032-5022 are reported. Using emission line intensity ratios in three different diagnostic diagrams these objects have been classified here, according to their principal excitation mechanisms, as Seyfert 2 type, even though for I 2032-5022 there could also be an appreciable contribution of photoionization by hot stars.

For I 0323-6054 and I 2032-5022 a typical density $N_e = 10^4 \text{ cm}^{-3}$ was adopted and the mean temperatures of the gas were estimated from the [O III] lines: $T \simeq 15850 \text{ °K}$ and 15525 °K . The oxygen and nitrogen abundances were estimated from the corresponding ionic abundances: $N(\text{O})/N(\text{H}) \simeq 0.8 \times 10^{-4}$ and 0.5×10^{-4} and $N(\text{N})/N(\text{H}) \simeq 5.5 \times 10^{-5}$ and 1.2×10^{-5} respectively. The nitrogen abundance of I 0323-6054 is close to the values found in many AGN, therefore the ratio $N(\text{N})/N(\text{O}) = 0.68$ (5.3 times the solar value) would reflect an underabundance of oxygen with respect to the nitrogen. The oxygen and nitrogen abundances found for I 2032-5022 are low, about 0.1 of solar values, but the ratio $N(\text{N})/N(\text{O}) = 0.22$ (1.7 times the solar ratio) suggests a ratio of these elements near to the normal for these type of objects.

On the other hand the heliocentric radial velocities of I 0230+0012, I 0323-6054 and I 2032-5022 were derived from the centroids of the gaussians fitted to the profiles of the strongest emission lines: $(6734 \pm 16) \text{ km s}^{-1}$, $(5602 \pm 14) \text{ km s}^{-1}$ and $(2646 \pm 9) \text{ km s}^{-1}$ respectively.

PHOTOMETRY AND INCLINATION STUDY OF THE SEYFERT GALAXIES OF THE CALÁN-TOLOLO SURVEY (CTS)

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In the *Calán-Tololo Survey of Emission Line Objects* (CTS), there have been found over 100 Seyfert 1 galaxies, 70 of which have been already published (1989, *ApJS*, 69, 349; 1992, *RevMexAA*, 24, 147). *UBVRI* CCD photometry for 64 of these 70 galaxies has been obtained at Las Campanas Observatory, using the 1-m telescope. The *U-B* versus *B-V* diagram for these galaxies shows that CTS Seyferts are located in the region corresponding to the mix, in different proportions, of a galaxy and a mini-quasar. Galaxies observed two or more times, and showing some variability sign, travel in the same mixing region of the diagram.

The semi-major and semi-minor axis for all objects were measured using contour diagrams in *V* images of the Seyfert galaxies, finding the well known result of a lack of galaxies edge-on ($b/a \simeq 0$).

A significant excess (600%) of objects with an axial ratio between 0.6 and 0.7 was found; this could indicate an excess of Seyfert galaxies at intermediate viewing angles, or it could be the result of some past interaction in these objects. Any of these two options gives important clues about the geometrical features of the "engine" in Seyfert galaxies.

MBG02223-1922: A NEWLY IDENTIFIED LUMINOUS SEYFERT GALAXY

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In the context of the Montreal Blue Galaxy (MBG) survey (Coziol et al. 1993, AJ, 105, 35), we report the identification of MBG02223-1922 (ESO 545- G 013, MCG-03-07-011, IRAS F02223-1921) as a new, bright, Seyfert 1 galaxy. In this work, we present optical spectrophotometry (from 4300 to 6800 Å) and direct imaging in *B*, *V* and *I* bands, obtained with the 2.1-m telescope at Observatorio Astronómico Nacional, B.C., México.

Analysis of the spectrum reveals unusually broad and composite forbidden lines suggesting a complex dynamical structure of the Narrow Line Region. For all the lines we find a broad component of 1000 to 2000 km s⁻¹ wide and a narrow one of about 400 km s⁻¹. We derive a redshift of $z = 0.0338 \pm 0.0002$ and an absolute magnitude $M_B = -21.8$ for this galaxy, which places it among the 10% most luminous Seyfert 1 galaxies known. Fluxes from the nucleus, from the far-infrared (*IRAS*) to the optical, follow a well determined power law, $F_\nu = \nu^\alpha$, with a relatively flat index, $\alpha = -1.34$, typical of *UV*-bright selected Seyfert 1 and QSOs.

This galaxy has also an extended emission line region and it is the host of a starburst. From spatial informations in long slit spectroscopy, we observe an emission region extending 2 arcsec with a giant H II region 5 arcsec west of the nucleus.

The object shows mildly strong IR luminosity, $L_{IR} = 6.3 \times 10 L_\odot$. This, along with a relatively flat far-infrared index ($\alpha(12,60) = -1.33$), an average value of the flux ratio $\log [F(60\mu\text{m})/F(\lambda 5007)] = 2.5$ and an internal reddening $E(B-V) = 0.38$ suggest that only a small amount of dust is present in the nucleus. The different properties of this object seem to indicate an intermediate nature between the two main Seyfert-type galaxies. MBG02223-

1922 is probably a good example of what is called a Seyfert 1.8.

The full version of this work has been published in Coziol et al. (1993, MNRAS, 261, 170).

MEPSICRON SPECTROPHOTOMETRY OF SEYFERT GALAXIES

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Based on observations of 52 Seyfert galaxies (26 Sy 1 and 26 Sy 2) carried out at the Observatorio Astronómico Nacional at San Pedro Mártir, B.C., the characteristics of the narrow line region (NLR) and the broad line region (BLR) were studied. We report the following results:

(1) The comparison of the observed line intensities with the Stasinska (1984, A&AS, 55, 15) models suggest that the photoionization mechanisms for line formation is dominant in the NLR, but in the case of [O II] an additional mechanism (possibly shocks) could be present.

(2) An estimate of the masses and sizes of the BLR of Sy 1 galaxies shows that the typical masses and radii are $\leq 10^8 M_\odot$ and ≤ 0.1 pc, respectively. It is found also that these objects are radiating on average at 1/8 of the Eddington luminosity.

(3) Using emission nebulae methods (Osterbrock 1989) it is found that the NLR masses and radii for Sy 2 galaxies are $\approx 10^{5-6} M_\odot$ and 50 pc.

(4) The presence of Fe II features in both types of Seyfert galaxies is studied and a correlation between the blue emission and the total optical emission is found.

PROGRAMA DE CONSULTA DEL CATALOGO DE CUASARES DE HEWITT Y BURBIDGE 1989

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El programa de consulta fue desarrollado para realizar una búsqueda selectiva de cuasares en el *Hewitt and Burbidge 1989 Optical Catalog of QSOs*, el cual contiene información de 4296 cuasares y 87 objetos BL Lac. El programa fue escrito en lenguaje C del sistema SUN, utilizando las capacidades

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