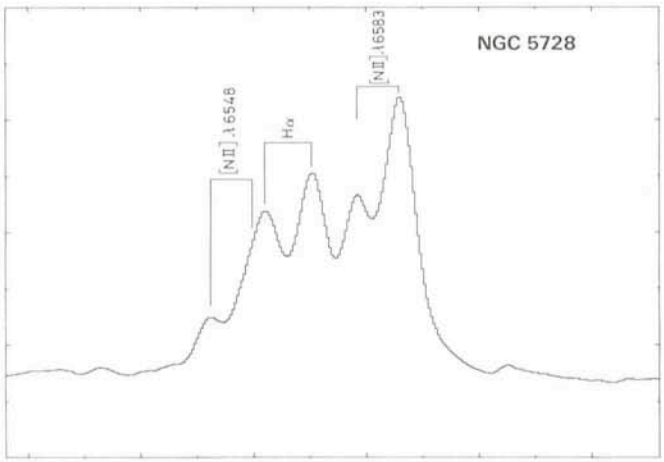


Fig. 2: *Spectrum of the nucleus of NGC 5728 obtained with the Image Dissector Scanner and the Boller and Chivens spectrograph attached to the 3.6 m ESO telescope. The aperture was 4 × 4 arcsec, the resolution about 4 Å. The double structure of the emission lines is clearly seen.*

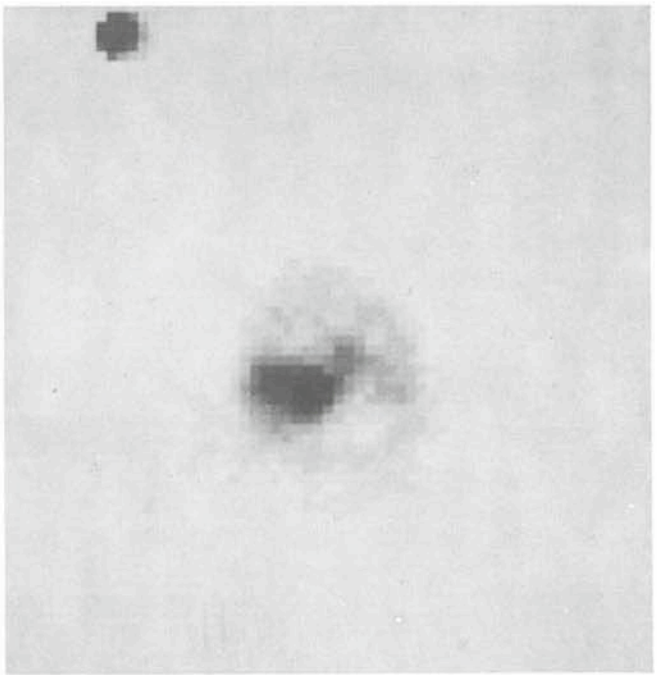

Fig. 3: *Difference of a red and an infrared CCD picture of the nuclear region of NGC 5728, showing the emission nebulosity. Its total NS extent is about 10 arcsec.*

velocity. The second, low velocity component, which is seen with a 4 × 4 arcsec aperture, but not with a 24 arcsec aperture, probably originates in the part of the ring which is close to the nucleus. A remarkable fact is that, in both components, [N II] λ 6584 > Hα, indicating that the material in the ring has the ionization characteristics of Seyfert nuclei rather than being ionized by hot stars.

We have obtained two 10-minute exposures of the nucleus of NGC 5728 with the ESO CCD attached to the Cassegrain focus of the Danish 1.5 m telescope at La Silla; one was through a r filter ($\lambda_0$ = 6580 Å, FWHM ~ 900 Å) containing the strong emission lines of Hα, [N II] and [S II]; the second through an i filter ($\lambda_0$ = 8190 Å, FWHM ~ 1880 Å) filter which avoids all emission lines of any significant strength. Fig. 3 is a subtraction of these two pictures (r – i) showing the emission nebulosity; this picture is similar two those of Rubin and Sandage and Brucato, although it shows more details. This nebulosity has sharp outer edges, but material is seen everywhere inside it, suggesting that it is an envelope rather than a ring.

Making use of the measurement of the velocity field by Rubin, we may conclude that it is an expanding asymmetrical envelope. It may even be that there is no gas in the nucleus and that the gas seen in the direction of the nucleus in fact comes from the far side of the shell.

A detailed study of the dynamics of this envelope of gas would certainly be of interest and could shed some light on the ill understood complex profiles of the emission lines in the nucleus of active galaxies (Heckman et al. 1981, *Astrophys. J.* **247,** 403). TAURUS, the Fabry-Perot imaging device of the Imperial College, London (Atherton et al., this issue) seems to be well suited for such a study.

The nuclear nebulosity of NGC 5728 is in some ways qualitatively similar to the Crab Nebula. The Crab Nebula is a somewhat ellipsoidal volume, about 4 pc in diameter (if its distance is 2 kpc), partially filled with emission filaments; this volume is expanding with a velocity at its outer surface of about 1,500 km $s^{-1}$ with respect to the centre. The emission line spectrum has the same main characteristics as the Seyfert 2 galaxies, including NGC 5728; the filaments are most probably radiatively ionized by the non thermal continuum filling the volume of the nebula. The loss of rotational energy by the central pulsar is an adequate supply for the energy requirements of the nebula (~ $2 \times 10^{38}$ erg $s^{-1}$) (see for instance IAU Symposium No. 46, 1971, "The Crab Nebula"). The NGC 5728 nebulosity is almost 3 orders of magnitude larger than the Crab's one; its expansion velocity is much smaller but it has been decelerated in the gravitational field of the nucleus; the energy is several orders of magnitude larger. The origin of the ultraviolet ionizing continuum and the source of energy are still unknown.

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