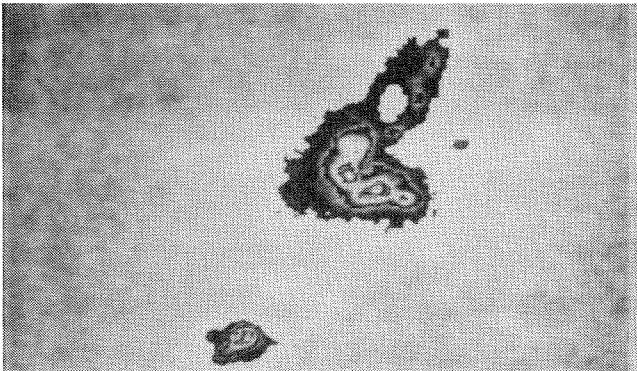


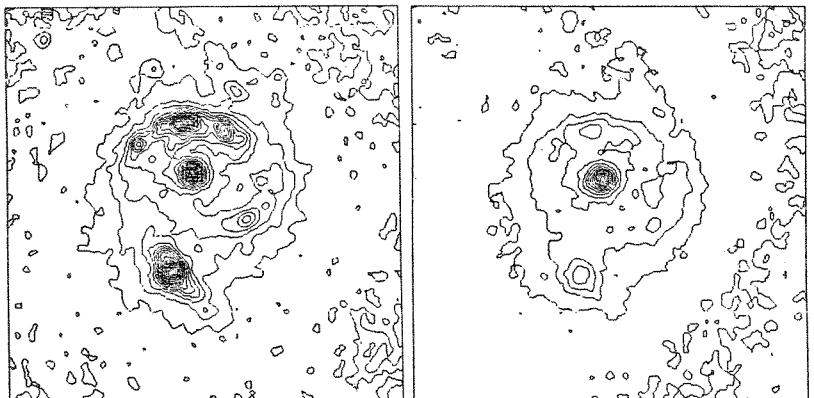
GALAXY IMAGING WITH THE CFHT PHOTON-COUNTING CAMERA

The photon-counting system referred to earlier in this bulletin was used successfully by C.T. Hua during an observing run in March 1983. Thanks to the quality of the seeing and the spatial resolution offered by the camera (0.3 arc-sec/pixel), Hua was able to obtain a detailed structural map of the nucleus of NGC 5457 (M 101). On photographic plates, the nucleus appears as a diffuse object of about 1 arc-min diameter. With the CFHT photon-counting camera, Hua obtained H α images through an interference filter centered at λ 6569. The images (an example is shown below) indicate that the nucleus contains a chain of H II regions with a northeast extension of about 20".



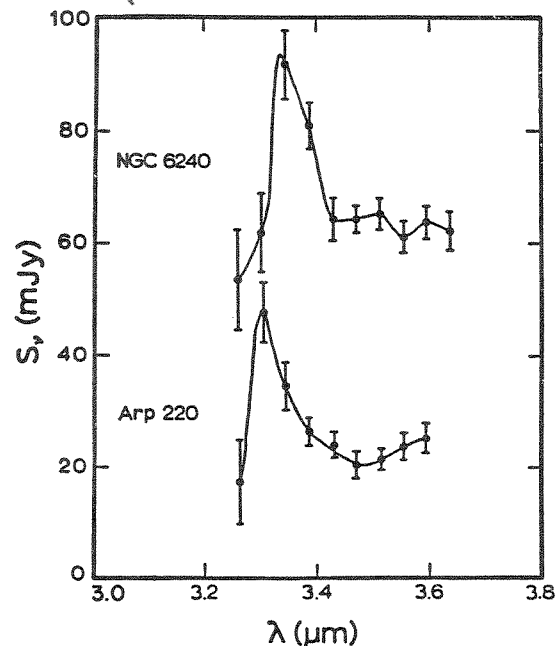
Hua also observed the peculiar Sbc-Sc galaxy NGC 3310 (Arp 217), which is classified as DDO type II. Assuming a Hubble constant of 55 kms⁻¹Mpc⁻¹, its redshift of 1084 kms⁻¹ places it at a distance of 20 Mpc, so that 1" corresponds to about 100 pc. In visible light, there is a smooth change in structure between the central regions and the outer parts (giving a bow-and-arrow appearance). The H α image shows spiral structure outlined by a chain of H II regions that takes on a crescent shape. A faint extension seems to connect the nucleus to the "Jumbo H II region" located at 12" southwest of the nucleus. The [NII] λ 6584 image displays a different distribution of gas, since the giant nebular region prominent in H α is rather faint in [NII]. To explain such a large H α flux requires a large number of ionizing stars with T_e greater than 10⁴ K.

Isophotal contours of NGC 3310 obtained after processing the CFHT H α (left) and [NII] (right) images using software available at L.A.S.-C.N.R.S. in Marseille. The entire field covers 1' x 1' so that detailed structure of about 3" can be outlined. The distribution of H II regions can be related to the presence of hot stars outlining the spiral structure of the galaxy. The [NII]/H α ratio most likely reflects an underabundance of nitrogen with respect to hydrogen.



3.27 μ m FEATURE IN NGC 6240 AND ARP 220

During a run last May, Chris McAlary (Steward Observatory) used the circular variable filter of the InSb photometer to detect the 3.27- μ m "solid-state" feature in the galaxies NGC 6240 and Arp 220 (see illustration). These galaxies are among the most luminous known, both having L \sim 10¹² L_⊙, most of which is emitted in the far infrared as was revealed by the IRAS satellite. The species which produces the 3.27- μ m feature is still unidentified, but it is known that this feature is associated with warm interstellar dust and frequently appears in regions of star formation.



McAlary's observations at CFHT were part of a larger collaborative program which included infrared and optical photometry and spectrophotometry of these galaxies obtained at the NASA IRTF, the MMT, and the Steward 2.3-m telescopes. On the basis of these data, the Steward team conclude that the central regions of both these galaxies have been the sites of powerful "starbursts", similar in character, but much bigger in size than that which occurred in M82.