ters can be remotely selected and positioned in front of the photographic plate. It has a maximum useful aperture of 220 x 220 mm. The plates have the dimensions: 240 x 240 x 2.3 mm, and the colour filters 230 x 230 x 2 mm or 230 x 230 x 10 mm if interference filters are used.

In addition to this unit will be constructed a *remotely-controlled* plate-changer containing up to eight photographic plates of 240 x 240 x 1 mm, or film sheets of 240 x 240 x 0.2 mm, which replaces the single-plate holder. The plate or film sheet is held to the back-up plate by a low vaccum. The introduction of the plate changer reduces the dead time and manipulation effort on the telescope, since the time to change a plate and filter will be only 20 sec, and this can be made in any telescope position. The eight plates are contained in a light-weight cassette which is connected easily to the general plate-changer housing when the telescope is in its horizontal position. The plates can be marked by an 8-digit alphanumeric LED unit, placed in the plate changer. This plate changer is actually in its final design stage and will be available in mid-1978.

A Dark Cloud in the Centre of Elliptical Galaxy NGC 3311

Professor Per Olof Lindblad spent the first half of 1977 with the ESO Scientific Group in Geneva. During this time he and Dr. M. Disney initiated a study of the structure of galaxies and together with Dr. S. Laustsen high-resolution photographic plates were obtained with the 3.6 m telescope. In this note Professor Lindblad discusses one of the galaxies and its companions.

The cluster of galaxies Abell 1060 is a fairly rich group of comparatively bright galaxies in the Hydra constellation at $\alpha = 10^h\ 34^m$ and $\delta = -27°\ 16'$. Close to the centre of the cluster we find two 12th-magnitude elliptical galaxies, NGC 3309 and 3311, separated by about 1.6, 3311 lying to the east of 3309.

The average radial velocity of the cluster is 3233 km/s relative to our local group of galaxies. Assuming a Hubble constant of 55 km s^{-1} Mpc^{-1}, we may thus derive a distance of 59 Mpc. This gives an apparent separation of the two elliptical galaxies of 27 kpc. The real separation in space may of course be larger, if they are not at exactly the same distance. The velocity difference between the two galaxies amounts to about 300 km/s.

According to photoelectric measurements by S. van den Bergh (*Astrophys. Journ.* **212,** 317, 1977) and by M. Disney,

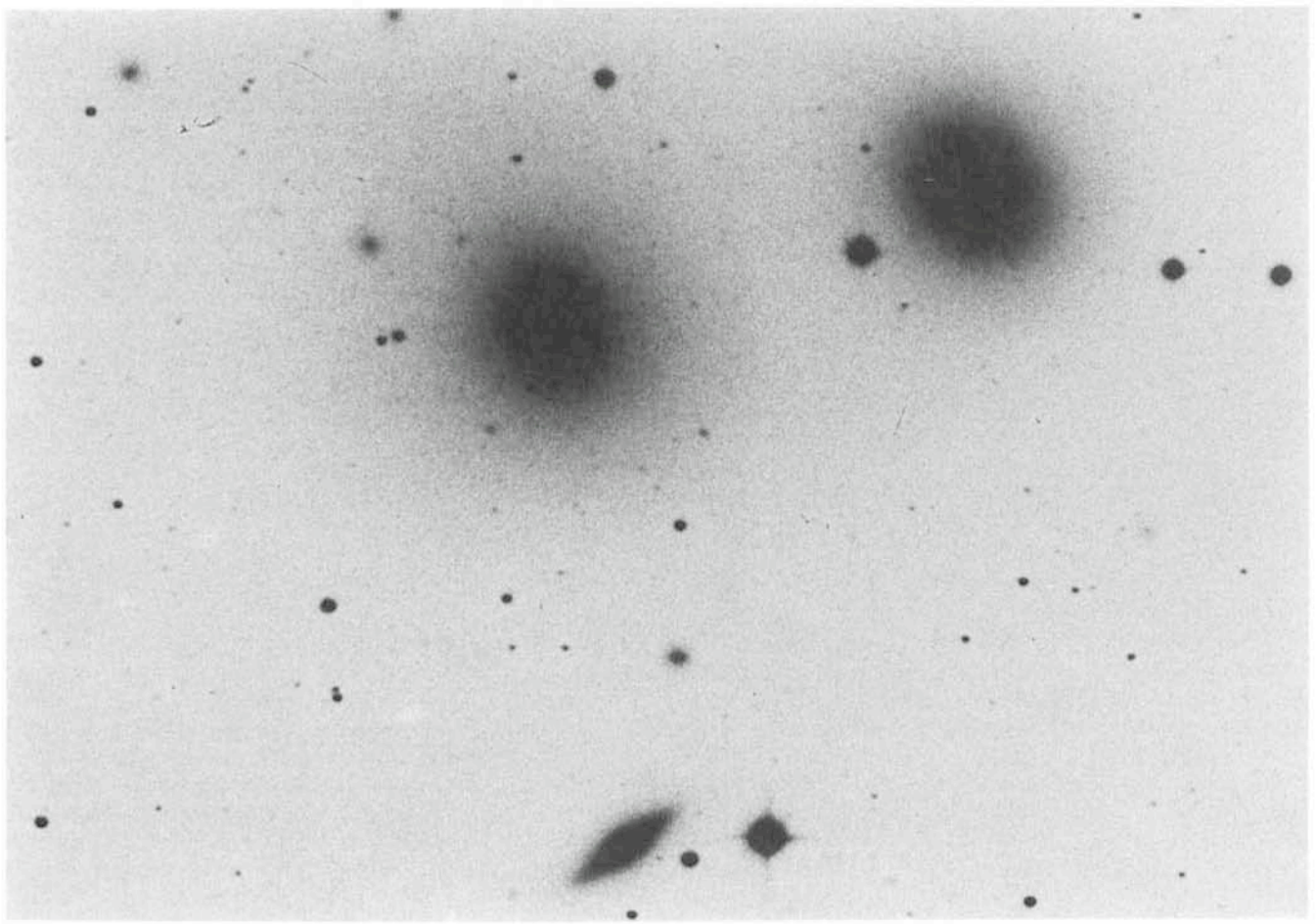


Fig. 1. — *The centre of Abell 1060 cluster of galaxies. To the upper right elliptical galaxy NGC 3309 and in the centre NGC 3311. The scale is given by the distance between the centres of NGC 3309 and 3311 which is about 100 arcseconds. The diffuse objects surrounding 3311 are globular clusters (see text). ESO 3.6 m telescope, 90 min. IIIa-J + GG 385.*

who spent some months of 1977 with ESO in Geneva, the brightness distribution is quite different in these two galaxies. This was the reason why a series of photographs centred on the group was taken by Svend Laustsen with the 3.6 m telescope in May 1977.

Figure 1 shows a reproduction of a 90-minute exposure in the prime focus on a baked IIIa-J plate with a GG 385 filter which covers the centre of the cluster. The different character of the two ellipticals may be seen already on this plate. Figure 2 is a 15-minute exposure with the same plate-filter combination. There, we surprisingly found a very marked absorption lane (dark cloud) at the very centre of NGC 3311. A close inspection shows a small bright spot just outside the eastern edge of the dark cloud. Also one may suspect an extremely narrow luminous bridge crossing the absorption lane from south-east to north-west, although this should be confirmed on other short exposures in very good seeing.

Malcolm Smith and Daniel Weedman (*Astrophys. Journ.* **205,** 709, 1976) using the 4 m telescope at Cerro Tololo discovered a large number of globular clusters surrounding NGC 3311 appearing at a magnitude of B ≈ 23.5–24. This halo of globular clusters is well seen in Figure 1, thus indicating the limiting magnitude of this 3.6 m plate.

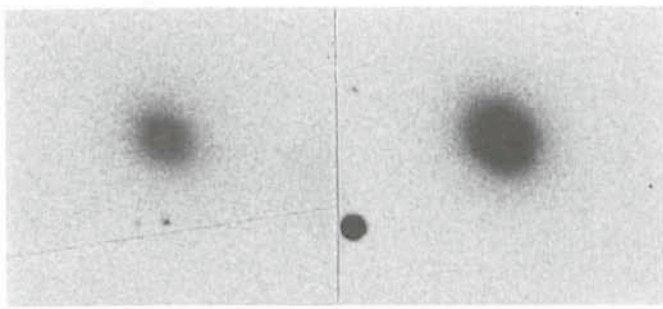
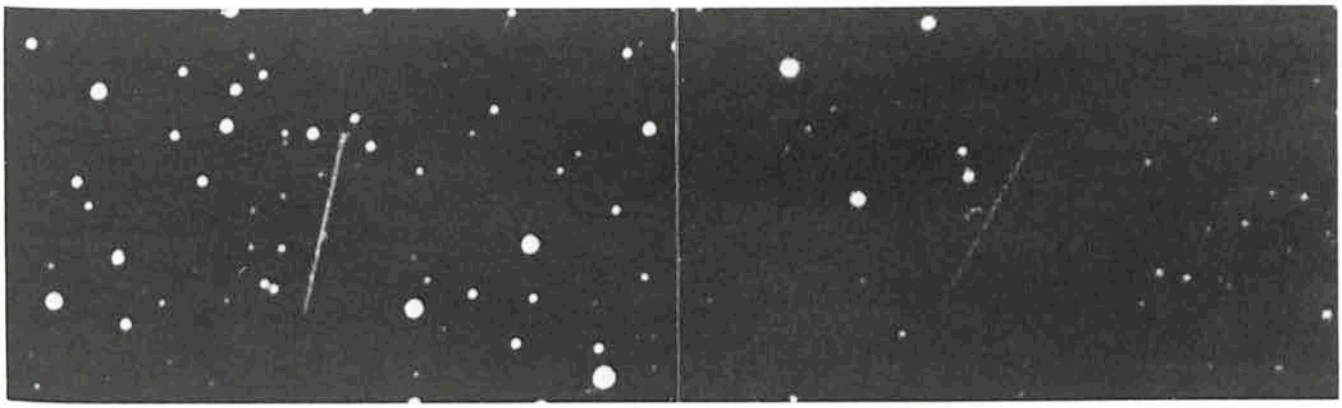


Fig. 2. — *The centres of NGC 3311 (left) and NGC 3309. The small dark cloud in 3311 is readily seen. 15-min exposure on IIIa-J + GG 385, ESO 3.6 m telescope.*

The cluster Abell 1060 is a relatively weak X-ray source with a large error box and with a luminosity of $1.5 \cdot 10^{43}$ ergs/s which is similar to that of the Virgo cluster.

The cluster is also a radio source. While the original Ohio position is more than half a degree off the cluster, M. Disney and J. Wall (1977, *Monthly Notices Roy. Astron. Soc.* **179,** 235) have now derived a new position with the Parkes telescope. The source is situated in the immediate neighbourhood of the two elliptical galaxies .

Latest Asteroid Discoveries at ESO



Two new minor planets were discovered with the ESO Schmidt telescope in April-May 1977. The photos show the discovery trails. To the left is that of MP 1977 HD which was seen on a 90-min red plate, obtained on April 27. It is remarkable because of its southern declination: it reached –67° in June. MP 1977 JA (to the right) was discovered on May 15. Both have very unusual orbits; 1977 HD belongs to the very rare Pallas *type (high inclination, semi-major axis 2.7 Astronomical Units) and 1977 JA is of* Phocaea *type (high inclination, semi-major axis 2.3 A.U.). Discoverer of both was ESO astronomer H.-E. Schuster.*

Design of the Coudé Auxiliary Telescope (CAT)

A unique feature of the ESO 3.6 m telescope is the Coudé Auxiliary Telescope that will feed the large coudé spectrograph. The design of the CAT is now virtually finished and ESO engineer Torben Andersen from Geneva reports:

Coudé Auxiliary Telescope

The ESO 3.6 m telescope will be equipped with a coudé spectrograph. Whenever the telescope is used in Cassegrain or prime focus, it would not be possible to use the coudé spectrograph unless another means of collecting star light were available. To provide a second light source for the spectrograph, a coudé auxiliary telescope (CAT) will be built and installed close to the 3.6 m telescope.

A model of the CAT is shown on Fig. 1. The telescope will be placed in a 24 m high tower (Fig. 2) which is already erected close to the 3.6 m building. The CAT will have an alt-alt mounting. This permits the exit light beam (passing through the hollow shaft of the south bearing) to remain on a fixed axis during its passage to the coudé spectrograph of the 3.6 m telescope. The light will pass from the CAT tower to the 3.6 m building within a steel tube, thereby preventing air turbulence between the buildings from deteriorating the optical quality.

Configuration

The CAT is primarily intended for spectroscopic use. Although a photometer could eventually be mounted on the centre section (in a Nasmyth mounting), it is unlikely that this will happen during the first years of operation.