the satellites, since there is no chance of finding enough stars with accurately-known positions among the faint stars in the small field around the planets. Therefore, ESO Schmidt plates will be used to measure the positions of the faint stars in relation to the brighter, standard stars, and in turn the positions of the satellites can then be measured relative to the faint stars, ensuring the astrometric tie-in to the brighter (standard) stars.

Preliminary observations were made in June 1977 at the ESO 1.5 m telescope in Cassegrain focus with the modified 16 x 16 cm camera and the TV-guiding system. In spite of rather bad weather conditions, some useful plates were obtained. However, as a greater number of stars (i. e. a larger field) would ensure a better accuracy, we hope soon to use the new Danish 1.5 m telescope with its large-field Ritchey-Chretien optics.

Finally, it should be mentioned that great care is also needed in measuring the plates on a two-dimensional coordinate measuring machine. Tests are in progress to determine what kind of machine is the best suited, the PDS-system at CDCA in Nice or perhaps the ESO S-3000 in Geneva.

"Optical Telescopes of the Future"

The Organizing Committee informs us that the preparations for this ESO conference are proceeding well. It will take place at CERN, Geneva, on December 12–15, 1977. Prospective participants who have not yet announced their arrival are requested to contact Dr. R. N. Wilson, ESO c/o CERN, CH-1211 Geneva 23, Switzerland, as soon as possible.

The programme will start on Monday 12 December with a general introduction, followed by a review of conventional large telescopes. Tuesday, 13 December, will be devoted to Incoherent Arrays and Multi-mirror Telescopes. Wednesday, 14 December, deals with Special Techniques, Coherent Arrays and Interferometers, and the last day, 15 December, is concerned with Image Processing and Live Optics and a discussion of the Astronomical Implications.

The conference is the first major, international one of its kind and has attracted a large number of well-known astronomers and experts from all continents. It is expected that the Proceedings will be published soon after, following the tradition of earlier ESO conferences.

The X-ray Cluster of Galaxies Klemola 44

On October 17, 1977, three astronomers sat together at lunch on La Silla. One, Dr. Massimo Tarenghi—newcomer to the Scientific Group in Geneva—had just returned from the Interamerican Observatory on Cerro Tololo. Another, Dr. Anthony C. Danks, recently joined ESO/Chile, and the third was the editor of this journal. By chance, Dr. Danks showed some plates of the cluster of galaxies Klemola 44 which he had obtained a few nights before with the 3.6 m telescope. Dr. Tarenghi told that he had observed the same galaxies spectroscopically the night before at Tololo. An intense exchange of information resulted. The editor smiled happily and then made the inevitable suggestion . . .

So here is the essence of that discussion, summarized by Dr. Danks.

The X-ray equipment of the University of Leicester aboard the satellite Ariel V recently detected a new X-ray source A 2344-28. The new source was quickly identified with the galaxy cluster Klemola 44 by Maccacaro et al. (1977). The cluster is shown in figure 1, reproduced from a plate which was taken at the prime focus of the 3.6 m telescope at La Silla by ESO astronomer Anthony Danks.

It is interesting to see that several of the galaxies appear to share common envelopes which are likely areas from which X-rays may be emitted. It is from such photographs that a detailed morphological study of the region can be made.

A large number of X-ray sources are now identified with clusters of galaxies thanks to the satellites Uhuru and Ariel V. But as the number of X-ray clusters of galaxies grows larger, the astronomer grows more curious and asks: "What mechanism produces such X-rays?" Already in 1972, Solinger and Tucker proposed a "thermal-bremsstrahlung" model. They were the first to show that there exists a relationship between X-ray luminosity (L_x) and the cluster velocity dispersion (ΔV).

It was noted that the brightest X-ray galaxy clusters were also the richest (more galaxies per unit area on the plate). They argued that cluster richness must be related to space density which is a measure of the gravitational field and that the gravitational field in turn must manifest itself in the velocity dispersion ΔV.

The "thermal-bremsstrahlung" model predicting that L_x is proportional to $(\Delta V)^4$ was reasonably consistent with the observations. By using this model, the mass of the galaxy cluster can also be calculated from the observed X-ray flux and is generally larger than the sum of the masses of the galaxies in the cluster. This leads to the suggestion that the additional mass is in intra-cluster matter, and that the X-ray flux is due to this radiating matter. Some evidence for such intra-cluster matter can be seen in figure 1.

Since this interpretation was published in 1972 many new X-ray clusters have been discovered. Some of the more recent clusters contain relatively few galaxies, raising the question "Are other X-ray production mechanisms possible?".

It appears that Klemola 44 is such a case. Maccacaro et al. (1977) already noted that the velocity dispersion ΔV was too low to fit the Solinger and Tucker relationship. But their value of ΔV was based on measurements of only 8 galaxies in the cluster. More measurements were needed to be certain of the ΔV value and Chincarini et al. (1977) have now confirmed the low ΔV value with redshift measurements of 24 of the galaxies in Klemola 44. They have convincingly argued that an Inverse-Compton scattering of synchrotron electrons by the microwave background could produce the observed X-ray flux. Of course, a source of relativistic electrons is necessary, but it could easily be supplied by one of the cD galaxies in the field. Confirmation of this