

pixel size (and sampling step) is 10  $\mu\text{m}$ . Oversampling down to 2  $\mu\text{m}$  can be used to digitize spectra; for some applications, pixels of 20, 30...80  $\mu\text{m}$  can be synthesized in real time.

The digitized images can be processed according to three main modes. On-line processing leads, through a multilevel thresholding technique, to a catalogue of positions, areas, fluxes and second-order moments. Off-line processing is possible on the site using DEC-3100 or SUN SPARC 2 workstations, and a VAX 8250 computer; the available software includes MIDAS and a number of tools specially designed to extract the best from the astrometric and photometric capabilities of the machine. Finally, the user can of course take the pixels with him to process them with his own facilities.

A wide variety of scientific projects are currently being carried out using MAMA. Several long-term programmes dealing with solar physics are based on spectral images from Pic du Midi, Teide Observatory (Tenerife), Sacramento Peak, and Meudon where spectroheliograms have been accumulated since the beginning of this century. Works concerning the solar system,

stellar populations and galactic structure as well as extragalactic astronomy are mainly based on Schmidt plates from Palomar, Siding Springs, Calar

Alto, Tautenburg, CERGA, and of course ESO.

Galactic structure surveys conducted with MAMA take advantage of the astrometric accuracy of the machine. Using plates taken over 40 years, relative proper motions are obtained by C. Soubiran (1991) for high numbers of stars with an accuracy of 1.5 milli-arc-sec/year, which compares favourably with the absolute accuracy of HIPPARCOS. This geometric accuracy of MAMA is also quite appreciable when reducing objective-prism images, since the quality of radial velocity determination strongly depends on the geometry of the measuring machine.

The photometric accuracy allows stellar magnitudes to be determined to within 0.05 mag., provided good sequences are available. This feature is of course interesting for the study of stellar populations as well as for extragalactic programmes. Among the latter, an extensive search for quasar candidates mainly based on multicolour photometry in the North Galactic Pole region; Schmidt plates taken at various epochs will also be used to investigate the variability of the detected galactic and extragalactic objects. Information about MAMA and reduction techniques can be found in the papers by Berger et al. (1991) (see also the paper by Guibert et al. (1990), and references therein).

Among the programmes currently on the way which are based on La Silla instruments let us quote an extensive project aimed at the search for baryonic dark matter in the Galactic halo. The technique consists in monitoring the magnitude of a large number of stars of

## SCIENTIFIC ASSOCIATE

A position as Scientific Associate will shortly be available in the Science Division's Astronomy Group at ESO Headquarters in Garching bei München for an astronomer with a Ph.D. degree or equivalent and several years of post-doctoral experience.

This is a senior position in the group, and the successful applicant will be expected to carry out an active research programme and to contribute significantly to the activities and responsibilities of the group. Scientific interests in the Astronomy Group include large-scale structure; quasars; AGNs; dynamics and chemical evolution of galaxies; supernovae and supernova remnants; variability of early-type stars; and the diffuse interstellar medium. In all areas emphasis is placed on high-quality data and its interpretation. Responsibilities include the guidance of students and junior fellows, the workshop and symposium programme, assistance to visiting astronomers using ESO's data reduction and remote observing facilities, and interaction with other groups at ESO Headquarters in matters ranging from telescopes and instrumentation to computing and image processing.

This position will be awarded initially for a period of one year, and may be renewed by one year or more to a maximum of six years. Applications should be submitted as soon as possible. Application forms can be obtained from:

European Southern Observatory  
Personnel Administration and General Services  
Karl-Schwarzschild-Str. 2  
D-8046 Garching bei München  
Germany

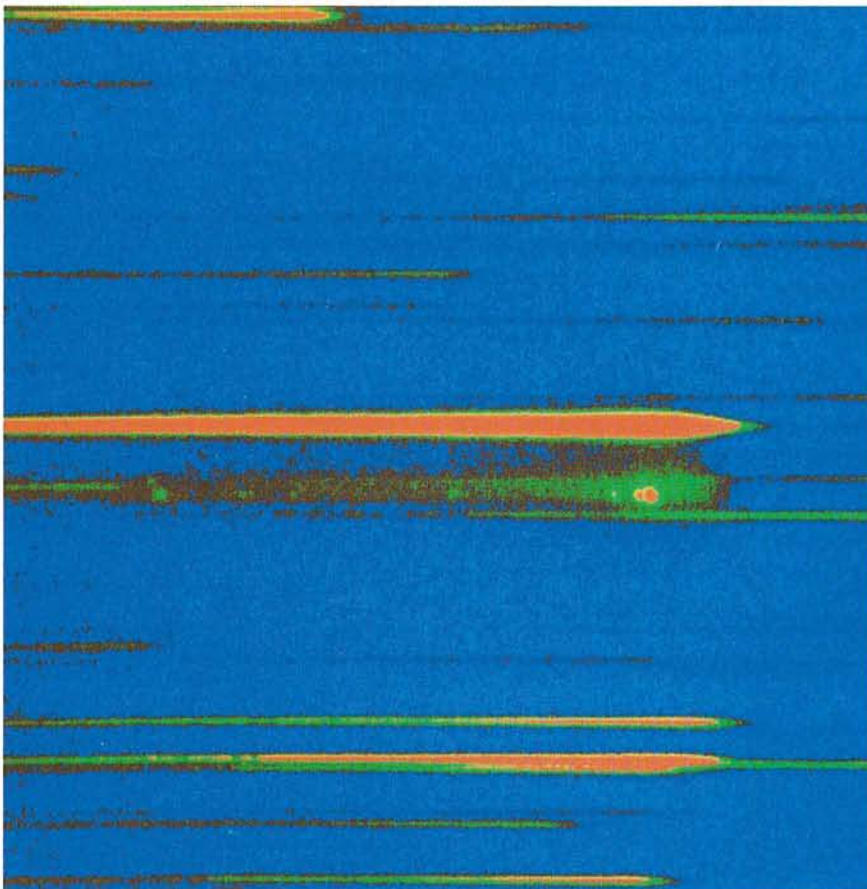


Figure 2: Strong emission in the objective-prism spectrum of a galaxy, indicating intense star formation. The plate (no. 7906) was obtained on March 6, 1989 with the ESO 1-metre Schmidt telescope, equipped with a 4° UBK7 prism; dispersion 450  $\text{\AA}/\text{mm}$  at 4350  $\text{\AA}$  and 750  $\text{\AA}/\text{mm}$  at 5000  $\text{\AA}$ . Exposure: 100 minutes on IIIa-J emulsion without filtre. Digitized with MAMA for a programme conducted by G. Comte (Observatoire de Marseille).