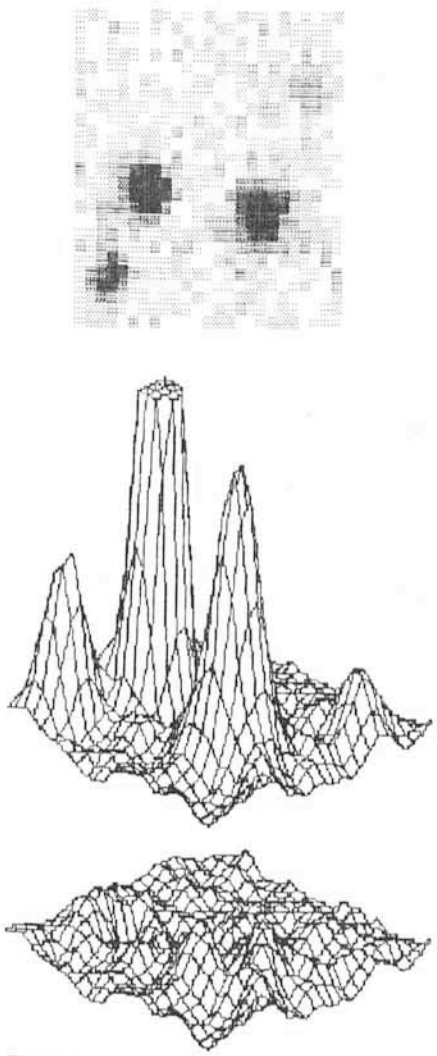

Figure 1.

- Examination of each stellar image to check for image quality, potential blending and missed fainter stars
- Fast nonlinear least squares fitting routines that allow up to five blended components to be fitted simultaneously
- Accurate and believable error estimates are determined for all fitted parameters
- Examination of the final fits by displaying the original data and residuals
- A proficient user can process 500 to 1,000 stars per day (depending on the crowding complexity of the field)
- Transformation of coordinates from one CCD frame to the system of another frame
- Transformation of instrumental magnitudes to a standard photometric system
- Plots the results on a standard HR diagram
- Artificial stars can be randomly inserted into the data at known flux levels to allow the user to find the systematic measurement errors.

A visual example of how ROMAFOT and MIDAS can be used to do photometric reduction in crowded stellar fields is shown in Figure 1 (all plots were made with PAWS).

Figure 1a shows a gray-scale represention of a crowded stellar field near the centre of Carina, a dwarf spheroidal galaxy in the Local Group. The data were collected with the ESO 3.6-m telescope using the EFOSC instrument with seeing of FWHM = 1.35 arcseconds in the V band. The integration time was 30 seconds. The subfield is 16.9 by 16.9 arcseconds in size. The intensity scale is linear with black representing the maximum and white representing the minimum intensity.

Figure 1b shows the same subfield in the form of a three-dimensional plot. The brightest star has a flat core because it was clipped for the plot to show better the fluctuation of the background. The second highest peak is composed of two closely spaced stars.

Figure 1c shows the residual field after all five stars were fitted. The visual magnitudes of the stars are 19.16 $\pm$ 0.01, 20.56 $\pm$ 0.05, 21.38 $\pm$ 0.11, 21.03 $\pm$ 0.06, 22.00 $\pm$ 0.16, respectively. The peaks of the two closely spaced stars (V = 20.31, V = 21.13) are separated by only 2.12 pixels. The full width at half maximum (FWHM) for these data is only 2.00 pixels, so these two stars are just barely resolved.

The above example shows how EFOSC can be used to obtain useful photometry for many faint stars with short exposures. The ability to reach a visual magnitude of 22 in just 30 seconds will be very useful to those astronomers who would like to determine the colour-magnitude diagrams of globular clusters and stars in the Galaxy and nearby Local Group galaxies.

The Future of ROMAFOT

Roberto Buonanno (Observatory of Rome), Rein Warmels (ESO) and I will be working in the next few months to officially implement the ROMAFOT package as a part of MIDAS. The exact form of the MIDAS version of ROMAFOT has yet to be finalized but it will probably be very similar to the system I have described above.

References

(1) D'Odorico, S., Dekker, H., "The Five Observing Modes of EFOSC, the ESO Faint Object Spectrograph and Camera Designed Around a CCD Detector".

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(3) Stetson, P.B., "DAOPHOT User's Manual", Dominion Astrophysical Observatory, Herzberg Institute of Astrophysics, 5071 West Saanich Road, Victoria, British Columbia V8X 4M6, Canada.

(4) Buonanno, R., Corsi, C.E., De Baise, G.A., Ferraro, I., 1979, in *Image Processing in Astronomy,* eds. G. Sedmak, M. Capaccioli, and R.J. Allen, Trieste, Italy, p. 554.

Storm Petersen and Astronomy

Robert Storm Petersen (1882–1949) started his career as a butcher, but became a symbol of arch-Danish humour during his lifetime. Although *Storm P.* (as he is known by his countrymen) wrote prolifically, he is more famous for his drawings which appeared regularly in Danish newspapers from 1905 to his death. Many of the early drawings dealt with social injustice, but he soon found his own, less offensive way of expression. A museum dedicated to his works has been opened in Copenhagen and also exhibits many of his cartoons. Many of them concern the exact sciences which Storm P. approached with a sound measure of down-to-the-earth scepticism. But his dry humour always treated members of the astronomical profession and other employees of the state with due reverence . . .

'The police now collaborates with the astronomers to determine the exact time when bicycle lights must be lit.'

EDITOR'S NOTE

The information about the bright supernova 1987A in the LMC which is brought on the following pages was received on March 2, 1987. The publication of this issue of the Messenger was delayed in order to include a first overview of the exciting results.