parameters and conditions. Since such life-supporting planets of distant stars are expected to be relatively faint objects seen very close to much brighter stars, their direct investigation will be very difficult even with the VLT. On the other hand, according to present theories, planetary systems may be much more conspicuous objects ("protoplanetary discs") during their formation. The closest region in our Galaxy where ongoing star formation has been observed is about 100 pc away. Thus, in order to observe features of the size of the earth's orbit, an angular resolution of about 0.″01 is needed. A VLT could not only provide (in principle at least) the required angular resolution but also (and this is even more important) a sufficient amount of photons to allow the use of methods like speckle interferometry on such relatively faint objects.

Stars in Other Galaxies

Having finished the part of my observing programme described above, I would still have 70 per cent of the allotted time left. I would use this larger part of my observing run entirely for medium or high dispersion spectroscopy of stars in nearby extragalactic systems. (Of course, I am also very much interested in spectroscopy of various types of galactic objects. However, for all my pet galactic objects there exists a sufficiently bright specimen which can be observed at any required spectral resolution with existing telescopes if up-to-date detectors and effective spectrographs are used.) The extragalactic part of my VLT observing programme would have the objective to determine the physical parameters (i.e. effective temperature, radius, mass, chemical composition, etc.) of some of the stars which make up these nearby galaxies. Thanks to high dispersion spectroscopic work on galactic stars and thanks to the refinement of our methods to analyse stellar spectra, the physical properties of the normal galactic stars are by now relatively well known. In extragalactic systems only a few bright stars in the Magellanic Clouds have ever been observed spectroscopically in some detail. For all other galaxies we simply *assume* that their stars basically have the same properties as those in our own Galaxy. On the other hand, nonstellar objects (like H II regions and globular clusters) that are bright enough to have been studied in extragalactic systems in many cases show significant differences when compared to their galactic counterparts. Therefore, I would not at all be surprised to find in extragalactic systems stars with (e.g.) higher mass or higher metal content than observed anywhere in the Galaxy. Since the nearby galaxies play an important role in establishing our extragalactic distance scale, such results may have profound effects on our knowledge of the large-scale structure of the Universe. Some work in this direction (e.g. in the local group of galaxies) can probably be done with our existing optical telescopes if modern detectors are used. However, in order to do even medium resolution spectroscopy of single stars in such important nearby galaxies as M 101 nothing less than a ground-based VLT will suffice.

Of course, there are many other interesting but at present "impossible" astronomical problems that could be tackled with a VLT. The questions described above are only those which I would attack first with this instrument. Having written these lines, my biggest question now is whether the observing programme outlined above will remain (science-) fiction or whether I shall indeed sometime have a chance to push the buttons and bang my head in the dark at the VLT!

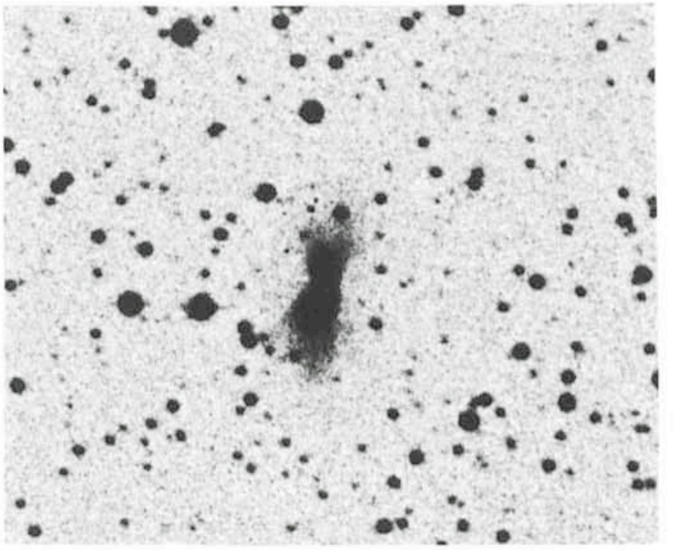
A New Bipolar Nebula in Centaurus

Looking through large Schmidt plates can be a rewarding, but sometimes also a somewhat frustrating business. Depending on the colour of the plate and on the exposure time, otherwise normal objects (galaxies, nebulae) may reveal features that make their classification difficult. A direct Schmidt plate says nothing about the spectrum of the objects, except when it is compared with other plates in other colours.

Thus, there are many objects on the one-colour ESO (B) Atlas which have to be described as just "peculiar", until their spectrum has been observed. One of these was found during the ESO/Uppsala survey of this atlas and also independently by two astronomers at the South African Astronomical Observatory, Drs. G. Wegner and I.S. Glass. It was designated as 172-?07 by the ESO and Uppsala astronomers who frankly did not know whether it was a galaxy or a nebula in the Milky Way.

Some light has been thrown on the nature of 172-?07 by the South African astronomers who recently obtained spectra of the object with the 1.88 m reflector at Sutherland. They find that only absorption lines are visible and that the spectral energy distribution corresponds to about spectral type F0. However, infrared observations with the same telescope reveal a clear IR excess, i.e. the object is brighter in the infrared than one would expect from the visual magnitude.

Wegner and Glass speculate whether 172-?07 is a pre-main sequence object, in which an envelope of dust shrouds a star that is contracting out of this dust. But most objects of this class show emission lines and it is therefore clear that the mystery about 172-?07 has not yet been solved.



ESO 172-?07, a bipolar nebula in Centaurus, photographed with the ESO Schmidt telescope on IIa-O emulsion, through a GG 385 filter. Exposure time 60 min.