differences between the visual and photographic appearances of any galaxy; and even with a photographic method, different lengths of exposure can considerably change the apparent structure. The use of photographs taken with large professional telescopes can prove especially confusing: long exposures are usually employed to capture the faint detail in the outer regions, but this results in over-exposure of the central regions and consequent loss of information. With the relatively small apertures available to most amateurs it is usually only those central regions which are recorded adequately, so that the problem of comparison is a very real one. This can be partly overcome by the use of 'master' photographs taken with the same telescope as will be used for the searching. In the case of a supernova in a previously uncharted galaxy, photography is used in order to establish a suitable series of comparison stars for subsequent visual or photographic monitoring. This is usually the major problem when a supernova is discovered, and sometimes the sequence of comparison stars may only be satisfactorily decided at a very much later date.

Because of the problems involved in the correct identification of true supernovae, great care has to be taken to ensure that all suspect objects are properly checked before any major alert is issued. Both for this reason and because there are so many galaxies which could be examined, some discretion has to be used in selecting the objects which are to be kept under surveillance. Spiral galaxies are the most favourable candidates, and in those which are face-on to us it is less likely that supernovae will be obscured by gas and dust in the galactic plane.

Photography of extragalactic objects is naturally of interest to many people. As with all the various galactic objects, a whole range of techniques may be employed to obtain good images keeping exposures as short as possible (page 177). Hypersensitization or cooled-emulsion methods can be exploited to produce pictures of the faintest objects.

Just as professional astronomers are turning more and more to highly sophisticated electronic equipment, so some amateurs are also exploring this field. Some are investigating the use of image intensifiers, for example, partly for the sake of interest, and partly for more serious photography and the detection of supernovae. Others are applying video and image-enhancement techniques (using microcomputers) to photographs of galaxies. Only time will tell whether these experimental projects will have lasting, positive results for the observation of distant galaxies.

Bottom:
The regions of Coma Berenices, Virgo and Leo, where we are looking away from the crowded plane of the Galaxy, contain many interesting extra-galactic objects.

Extragalactic objects

Large Magellanic Cloud (LMC)	Nearest system, contains Tarantula Nebula ***	M49 Vir	Elliptical galaxy	M81 UMa	Spiral galaxy **	M90 Vir	Spiral galaxy
Small Magellanic Cloud (SMC)	**	M51 CVn Whirlpool Galaxy	Striking spiral galaxy **	M82 UMa	Spiral galaxy *	M91 Com	Spiral galaxy
M31 And Andromeda Galaxy	Nearest major system **	M58 Vir	Spiral galaxy	M83 Hya	Spiral galaxy **	M94 CVn	Spiral galaxy **
M32 And	Companion to M31	M59 Vir	Elliptical galaxy	M84 Vir	Elliptical galaxy	M98 Com	Spiral galaxy
M33 Tri	Large nearby spiral **	M60 Vir	Elliptical galaxy	M85 Com	Elliptical galaxy	M99 Com	Spiral galaxy
		M61 Vir	Spiral galaxy	M86 Vir	Giant elliptical galaxy	M100 Com	Spiral galaxy
		M64 Com Black-eye Galaxy	Spiral galaxy **	M87 Vir	Elliptical galaxy, powerful radio source	M101 UMa	Spiral galaxy *
		M65 Leo	Spiral galaxy	M88 Com	Spiral galaxy	M104 Vir Sombrero Galaxy	Edge-on spiral galaxy
		M66 Leo	Spiral galaxy	M89 Vir	Elliptical galaxy	M106 CVn	Spiral galaxy
		M74 Psc	Spiral galaxy			M110 And	Elliptical galaxy, companion to M31