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The Luminosity Functions and Relative Distances of Rich Clusters of Galaxies. GEORGE O. ABELL, *Department of Astronomy, University of California, Los Angeles.*—A knowledge of the luminosity function of galaxies in rich clusters is important for the determination of relative distances of clusters. A program is in progress to determine the bright end of the luminosity functions of about 30 rich clusters by a method of extrafocal photographic photometry carried out with the 48-inch Schmidt telescope of the Palomar Observatory.

In each cluster field, magnitudes of a number of stars are determined photoelectrically. Magnitudes of galaxies are determined by comparing the galaxian images to those of the standard stars on each of several plates taken at various distances out of focus. The measures are made in two colors, corresponding, approximately, to international photographic and photovisual magnitudes.

The integrated galaxian magnitudes are derived from the run of magnitudes obtained from successively larger extrafocal images by a technique developed by Abell and Mihalas. It is necessary to assume a particular relation between the surface brightness of a galaxy and the distance from the center of the projected galaxian image. A suitable interpolation formula for the surface brightness has been determined recently for 12 elliptical galaxies, eight by photoelectric and four by photographic measures.

Luminosity functions are now available for five clusters. All show several distinctive features which permit the determination of differences in distance moduli between the different clusters. The most important feature is a preliminary maximum similar to a corresponding feature found in the luminosity function of the Ursa Major Cluster Number 1 by Baade in 1928 and by Seyfert in 1937. This maximum appears to be a stable characteristic of the luminosity function of galaxies in clusters. The brightest cluster members range from 1.5 to 2.5 mag.

brighter. The difference between the magnitudes of the maximum and the 10th brightest cluster member varies from cluster to cluster by more than 0.5 mag.

Light and Color Measures of Magnetic Stars. HELMUT A. ABT AND JOHN C. GOLSON, *Kitt Peak National Observatory.*—A program is under way to obtain photoelectric photometry on the *UBV* system of nearly all the known peculiar A-type stars, using the 16- and 36-inch reflectors on Kitt Peak. The purpose of the project is to locate these stars in a *U-B*, *B-V* diagram and to determine which ones are variable in light and color. It has been found that except for the silicon-rich stars, the peculiar A-type stars fall on the main-sequence line in the *U-B*, *B-V* plane and show about as much scatter as do normal A-type stars. The silicon-rich stars, however, show considerable ultraviolet and blue excesses; these cannot be attributed to interstellar reddening or intrinsic variability. Among 17 stars measured at least three times, about 60% seem to be variable in light, about 35% show a detectable variation in *B-V* color, and only about 10% show a detectable variation in *U-B* color.

Lifetime of Solar Granules. J. D. R. BAHNG AND M. SCHWARZSCHILD, *Princeton University Observatory.*—A sequence of high-definition photographs of the solar granulation was obtained on the Stratoscope flight of August 17, 1959. The sequence covers a time interval of eight minutes. The correlation function in time for the photospheric intensity variations has been determined from these photographs, with the help of an optical method proposed by Kovasznyai.

The resulting correlation function can be closely represented by an exponential decay:

$$R(\Delta t) = \exp(-\Delta t/6.3 \text{ minutes}).$$

If the average lifetime of granules is defined as twice the time interval in which the correlation drops to