

Surface Photometry of NGC 6946

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The late type spiral galaxy, NGC 6946 was scanned to get the physical parameters of this galaxy. From the overall feature of the intensity profile this galaxy was classified as type II according to Freeman's classification. The extrapolated apparent total magnitude was $B_T=8.15$, and this magnitude was in the range of ScI Type.

Photoelectric Observations of Extremely Young Open Clusters*

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During the period between January and November in 1982, *UBV* photometric observations were made for 48 stars in NGC 2264, 66 stars in IC 1805 and 22 stars in IC 348. From these observations, various physical parameters such as distance, mean color excess, total-to-selective extinction ratio and mean age of cluster have been determined. From these parameters, we estimated the star formation rates of IC 348 and NGC 2264. The result shows that the star formation rate depends on both time and stellar mass. The overall formation rate is found to increase rapidly during the period of the active star formation. The age spread ($5 \times 10^6 \sim 10^7$ yrs) of stars in a given cluster appears to be real which occurs in extremely young open clusters. A few peculiar stars in each clusters were observed and their characteristics are discussed.

Photometric Observations of Giant Stars in Extremely Old Open Clusters, M67 & NGC 2420*

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We made *UBV* photoelectric observation for selected bright stars of M 67 and NGC 2420 in order to determine their distance modulus, interstellar reddening, metal abundance and age along with individual masses. Making use of the luminosity functions for 6 open clusters, we examined the stars of blue stragglers and clump stars from an evolutionary point of view. Blue stragglers and clump stars are found to be horizontal branch stars or asymptotic giant branch stars.

Mass Functions of Open Clusters

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We derived the luminosity functions (LF) and the mass functions (MF) of eleven open clusters

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whose proper motion and photometry data have been accurately determined. These LF and MF of all clusters were compared with their ages, metal abundances and total masses.

From these, the following results were obtained:

(i) The slopes of LF and MF could be divided into four groups according to the cluster age and they are in the ranges of $p(\text{LF})=0.24\sim 0.39$ and $x(\text{MF})=1.32\sim 6.14$ in the mass ranges of $1m\sim 25m$, respectively.

(ii) The mean slope of MF is given by $x=1.90\pm 0.20$ and this value is smaller than $x=1.35$ (Salpeter 1955) for the field stars.

(iii) The slopes of MF show a slight correlation with metal abundance of clusters.

Time-Dependent Initial Mass Spectrum and Present Day Mass Function of Open Clusters

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아주 젊은 산개 성단에서 별의 탄생은 비동시적($\Delta=10^4\sim 10^6$ yrs)이고 또 탄생율은 별의 질량에 따라 다르다는 관측적 사실과 별의 형성에 관한 분화와 응집이론을 고려하여, 여기서는 별의 생성에 대해 time-dependent mass function과 time-depedent birth rate를 가정한다. 이러한 조건과 전주계열(pre-MS)의 진화시간을 고려하여 각 성단에서 주계열성에 대한 이론적 현재 질량함수(Present Day Mass Function)를 유도하고 이를 관측적 PDMF과 비교함으로써 산개성단의 형성과정에 대해 살펴보고자 한다.

이러한 조사를 위해 고유 운동과 광진 측광이 잘 수행된 산개성단, Hyades, Praesepe, Pleiades, NGC 2516, NGC 654, NGC 6530, h+ χ Persei의 광도함수를 구하고 여기에 brightening effect를 보정한 후 질량—광도 관계를 적용하여 주계열성의 PDMF를 구했다.

UBV Light Curve of UV Psc

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In the present work, *UBV* photoelectric observations of short period binary system, UV Psc ($p=0.861046$), were made for ten nights from October 1982 to February 1983 using the 61cm reflector of Sobaeksan Station.

From the observed light curve, we obtained a total of six times of minima in three colors and confirmed an asymmetrical distortion wave which was detected by Oliver (1974). Our light curve shows an evidence that the color dependence of amplitude increases at shorter wavelength.

We also found that total light of this system (Δm scale) has changed from that of Zeilik et al. (1982). This light curve variation is inferred to intrinsic variability of the components by a reason which is not yet fully understood.