

[S01-1] Super-Helium-Rich Populations in Globular Clusters

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Recent observations for the color magnitude diagrams (CMDs) of the massive globular cluster Omega Centauri have shown that it has a striking double main sequence (MS), with a minority population of bluer and fainter MS well separated from a majority population of MS stars. Here we confirm, with the most up-to-date Y2 isochrones, that this special feature can only be reproduced by assuming a large variation ($dY = 0.15$) of primordial helium abundance among several distinct populations in this cluster. We further show that the same helium enhancement required for this special feature on the MS can by itself reproduce the extreme horizontal-branch (HB) stars observed in Omega Cen, which are hotter than normal HB stars. Similarly, the complex features on the HBs of other globular clusters, such as NGC 2808, are explained by large internal variations of helium abundance. Supporting evidence for the helium-rich population is also provided by the far-UV (FUV) observations of extreme HB stars in these clusters, where the enhancement of helium can naturally explain the observed fainter FUV luminosity for these stars. The on-going UV observations with GALEX will reveal whether the similar trend is observed in other globular clusters as well. The presence of super-helium-rich populations in some globular clusters suggests that the third parameter, other than metallicity and age, also influences CMD morphology of these clusters.

[S01-2] GALEX Nearby Galaxy Survey

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GALEX 자외선우주망원경을 이용한 Nearby Galaxies Survey (NGS) 프로젝트에 포함된 주요 과학임무 및 결과에 대하여 발표한다. 나선은하, 타원은하 및 불규칙은하 등 다양한 형태를 갖는 약 300여개 은하들에 대한 근자외선 및 원자외선 파장의 관측이 수행되었으며, 은하형태에 따른 자외선 특징에 대하여 조사하였다. 또한, 성단의 나이에 민감한 자외광량으로 부터 가까운 (< 3 Mpc) 은하들에 있는 성단들의 나이분포를 조사하였으며, 다양한 형태의 은하에 있는 성단들의 자외선 특성을 우리은하 구상성단들과 비교함으로써 은하의 형성기원 및 진화에 대하여 논의한다.