

morphology significantly in the Hubble time. We analyzed the luminosity profiles of 104 bright barred galaxies to examine the frequency of occurrence of the type II disk (Freeman 1970) which is thought to be the result of secular evolution driven by the bar (Norman and Sellwood 1996). Our analysis of the luminosity profiles along the major axes of barred galaxies shows that about 70 % of the present sample seems to have the type II disks with a high tendency of preferential occurrence of type II disks in the late type galaxies. The analysis of the de Jong's near IR and optical photometry of 86 face-on disk galaxies shows the same results for the barred galaxies. However, the ordinary spiral galaxies (SA) in the de Jong's sample have only 30 % of type II disks. The present study strongly suggests that the secular evolutions in disk galaxies can be inferred from the characteristics of the luminosity profiles of the galaxies.

ON THE ULTRAVIOLET RADIAL COLOR GRADIENT IN ELLIPTICAL GALAXIES

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Far UV color gradients within early-type galaxies have been observed by the Ultraviolet Imaging Telescope during the Astro-1 mission. We investigated probable effects produced by age and metallicity gradients within elliptical galaxies, which might give plausible explanation for galaxy formation such as inside-out history. We use most recent Yale Isochrones and HB tracks in the construction of our population synthesis model.

A TEST OF THE INTRACLUSTER GLOBULAR CLUSTER MODEL

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There are known to be several giant elliptical galaxies with high specific frequencies of globular clusters, which possess about three or more times the normal number of globular clusters for their luminosity (the specific frequency is defined as the number of globular clusters per luminosity $M_V = -15$ mag) of the parent galaxy). The origin of the specific frequency is considered to be the most outstanding problem in recent extragalactic globular clusters research. Two competing scenarios have been suggested to explain the origin of the high specific frequency globular cluster systems - the empirical result that such systems are

only found in cD galaxies and the recent suggestion by West et al. (1995, ApJ, 453, L77) that such systems are instead due to the presence of a large number of intracluster globular clusters. We have performed a definitive test of the idea of West et al. by investigating the globular cluster system in NGC 4696. NGC 4696 is a giant elliptical, but not a cD galaxy, located at the dynamical center of the rich Centaurus cluster. The West et al. scenario predicts about 6 times more globular clusters than normal for its luminosity. We have found that the specific frequency of the globular clusters in NGC 4696 is not as high as expected by West et al.'s theory, but instead similar to other normal elliptical galaxies. This result rules against the intracluster origin for the high specific frequency globular cluster systems.

고려시대의 흑점과 오로라 기록 분석

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고려시대의 흑점과 오로라 기록을 수집하여 분석하였다. 태양 흑점은 237년 (1151-1387)에 걸쳐 33일 동안 40회의 기록을 발견하였다. “氣”로 표현된 오로라는 370년(1012-1381)에 걸쳐 106일 동안 115회의 기록이 있다. 기록된 현상을 강도별로 분류한 뒤, 흑점과 오로라 기록 분포의 power spectrum을 계산하여 각각의 주기를 찾았다.

흑점기록분포에서는 11년과 약97년의 주기를 발견하였다. 이는 500-600년 뒤부터 시작된 서양의 흑점 관측자료로부터 오늘날 밝혀진 주기인 11.3년 단주기와 약 80년 장주기와 잘 일치하여 주목할 만한 것이다. 오로라 기록에서도 10년과 약 60년 정도의 주기를 발견하였다. 이 역시 현재 알려진 오로라의 주기 11년과 잘 일치한다. 본 연구에서 발견한 오로라의 60년 장주기 변화는 앞으로 연구해야 할 흥미로운 것이다. 또한 오로라 기록의 장, 단주기 변화는 흑점기록의 분포와 잘 일치하고 있어 두 기록이 상관관계가 있으며, 모두 과거 태양활동의 변화를 나타내고 있음을 알 수 있다.

고려시대의 오로라 기록은 “氣”라고 표현된 고려시대의 기록 중 대부분을 차지하는 “赤氣”기록만을 선택하였다. 본 연구에서 고대 사서에 “氣”로서 표현된 현상의 상당수가 태양활동의 지표인 오로라 현상임을 증명하였다.

FLUORESCENCE PROCESSES OF C₂H₆, H₂O, AND CS IN COMETS

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Recent bright comets, such as comets Hyakutake (C/1996 B2) and Hale-Bopp(C/1995 O1), provided unprecedented strong lines of cometary molecules. These spectroscopic observations were made at modern observatories with cutting-edge detectors. At the feast of the