[ST13] Photometric Study of the Multiple System V432 Persei and its Implications

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We present new multi-color CCD photometry for the short-period close binary V432 Per, made on 6 nights from February to December 2006. A period study of the system, based on all published and newly observed times of minimum light, reveals that the orbital period has been varied as a beat effect due to the combination of a secular period increase and two sinusoidal variations, with the periods of P1'=34.8 yr and P1' =9.8 yr and the semi-amplitudes of K1=0.014 d and K2==0.002 d. A continuous period increase could be interpreted as a conservative mass transfer from the less massive star to the more massive component in the system with a rate of 1.18×10-7Msun yr-1. Of the possible causes for the sinusoidal variations, apsidal motion and asymmetrical eclipse minima due to starspot activity can not explain the quasi-periodic O-C residuals. It is still possible that the sinusoidal components of the period variability are produced either by light-time effects or by period modulations of the more massive and cool component, but light variations do not conform to a prediction of the Applegate mechanism. Our light curves, showing the total eclipse at secondary minimum and the variable O'Connell effect, are best modelled by considering a third light and a cool spot on the primary component. The result represent that V432 Per belongs to the A subgroup of W UMa-type contact binaries, which consists of the hotter, more massive primary star with a spectral type of G4 and the cooler, less massive companion with spectral type of G8-G9. We believe, therefore, that the most likely explanation of the sinusoidal variations is either the existence of the third and fourth bodies or some combination of a light-time effect and a magnetic activity cycle, which may be an important clue to understand the formation and evolution of the binary system.

[ST14] Sco-Cen Project : the Origin of Nearby Young Stars?

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1990년대 후반 관측천문학의 황금기에 들어서, 태양 인근지역에서 함께 움직이는 별무리들이 (예, TW Hydrae Association, the Tucana/Horologium Association, the β Pictoris Moving group, the AB Doradus Moving Group) 발견되었다. 이들은 지구에서 60pc 이내에 있으며 나이가 젊다(8-50 Myr). 그러나 태양 인근 100pc 이내에서는 아무런 분자운의 흔적을 발견할 수 없다. 이들은 어디에서 온 것인가? 어떻게 생성된 것인가? 이들 별들의 공간운동벡터를 이용해 시간을 거슬러 살펴보면 태양에서 제일 가까운, 활발한 별 탄생지역 Sco-Cen 지역과 만난다. Sco-Cen 별탄생 지역은 위치, 나이, 역학적으로 구분되는 3개의 세부지역으로 구성되어 있고, 여러 별자리에 걸칠 정도로 너무 넓은 관계로 자세히 연구되어 있지 않다. 우리는 남반구 여러 망원경을 이용한 분광관측을 통해 Sco-Cen 지역 별들 중 조기 M형까지 구성원을 밝혀내고자 한다. 또한 시선속도, 질량, 나이등 엄밀하게 구한 물리량과 기존 자료들을 바탕으로 Sco-Cen 지역 별탄생의 역사, 그리고 태양인근 젊은 별과의 상관관계를 밝히고자 한다. 본 발표에서는 현재까지 진행된 CTIO Hydra 관측전략, 관측후보 선정 및 2007A 시험관측 결과 등에 관해 논한다.