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The Double Pulsar (PSR J0737−3039) is the only neutron star−neutron star (NS−NS) binary in which both NSs have been detectable as radio pulsars. The Double Pulsar has been assumed to dominate the Galactic NS−NS binary merger rate R_g among all known systems, solely based on the properties of the first−born, recycled pulsar (PSR J0737−3039A, or A) with an assumption for the beaming correction factor of 6. In this work, we carefully correct observational biases for the second−born, non−recycled pulsar (PSR J0737−0737B, or B) and estimate the contribution from the Double Pulsar on R_g using constraints available from both A and B. Observational constraints from the B pulsar favour a small beaming correction factor for A (~2), which is consistent with a bipolar model. Considering known NS−NS binaries with the best observational constraints, including both A and B, we obtain $R_g=21_{-14}^{+28}$ per Myr at 95 per cent confidence from our reference model. We expect the detection rate of gravitational waves from NS−NS inspirals for the advanced ground−based gravitational−wave detectors is to be 8_{-5}^{+10} per yr at 95 per cent confidence. We discuss prospects of gravitational−wave detection based on our results. Implications of PSR J1906+0746, which is likely to be another tight NS−NS binary in the Galactic disc supported by recent observation, are also remarked.

[포 ST−03] Period changes in the Intermediate Polar MU Camelopardalis

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Period changes found in the 10 years CCD BVR photometry data (2005 - 2014) of the Intermediate Polar MU Cam will be discussed. The timings of extrema of the data are determined and the new ephemeris for the spin period and orbital period have been calculated by using multi−periodic approximation as follows: BJD(orb)=2454085.46(19)+0.19664 10(26) • E and BJD(spin)=2454085.50725(91)+0.013740942(13) • E−1.51(10)×10^{-12} • E^2. The O−C diagram shows an increasing of the spin period as $\dot{P}=-2.20(14)\cdot 10^{-12}$s/s. It is also found in MU Cam that the white dwarf's rotation seems to be switched from a state of spin−down to spin−up by the white dwarf's equilibrium spin period in 2005.

[포 ST−04] The isochrones for the various abundance of C, N, O, Na, Mg, Al, Si, and Fe

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This research is to study the effects of individual metal elements(C, N, O, Na, Mg, Al, Si, and Fe) on the standard stellar models. The mixtures of the stellar models have been constructed to analyze the stars, extremely changed in the abundance of these elements. Therefore the mixture are based on the recent observation of stars in globular clusters. And the mass and metallicity grids have been decided in range 0.7 ~ 1.0$M_\odot$ and 0.0002 ~ 0.007, respectively. The evolutionary tracks and isochrones, as well as the physical changes at each evolutionary phase, have been analyzed. Consequently, we present the mechanisms of the physical changes at each phase, and the quantified effects of the individual elements.

[포 ST−05] Period Analysis of a δ Scuti−type Variable HD5371

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HD 53711 ($\alpha_{2000}=00^h\,57^m\,31^s.7$ $\delta_{2000}=+75^\circ\,18'\,04''.8$)은 2009년 처음으로 δ Scuti 형 변광성으로 분류되었으나(Gregor 2009) 그동안 구체적인 변광 주기 분석이 이루어지지 않은 항성이다. 강원대학교 천체 관측실에서는 이 변광성에 대한 정확한 변광 주기를 분석하기 위한 관측을 수행하였다. 관측은 2014년 10월부터 2015년 2월까지 14−인치 및 10−인치 슈미트−카세그레인식 망원경과 QHY9 CCD 카메라를 사용하였다. 총 6일의 관측을 수행하여 얻은

측광 자료에 대하여 Period04를 활용한 power spectrum 분석을 통해 변광 주기를 찾았다. 이 분석을 통해 2개의 변광 주기 f_1=7.127c/d, f_2=1.995c/d를 찾았다. 2개의 주기 가운데 f_1은 fundamental mode로서 Gregor(2009)가 처음으로 제시한 주기 0.1389 day와 일치하는 것이며, f_2는 이 연구에서 새롭게 찾은 주기로서 non-radial mode에 해당되는 것으로 해석하였다. 분석 결과를 바탕으로 HD5371의 변광 특성과 물리적 성질을 논하였다. HD5371의 완전한 주기 해를 얻기 위한 장기 관측을 수행 중에 있다.

[포 ST-06] Comparison of multi-planetary systems including hot-Super Earth with and without exo-Jupiter

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Almost hot-Super Earths (R_p~1 to 4R_{earth} orbital period < 100 days) are around Sun-like stars. But our solar system does not have hot-Super Earth. Andre et al. 2015 has explained this phenomenon by that Jupiter blocks migration of super earth. We have found a multi-planetary system KOI-94 with exo-Jupiter and hot-Super Earth from NASA exoplanet archive data (http://exoplanetarchive .ipac.caltech.edu). In this study, within multi-planetary systems including hot-Super Earth, we compared those with and without exo-Jupiter using their host star and exoplanet parameters, such as metallicity [Fe/H], T_{eff} and R_*/R_p.

[포 ST-07] O VI Raman spectroscopy of the S-type symbiotic star V455 Sco

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We present the high-resolution spectrum of the S-type symbiotic star V455 Sco obtained with the Dupont telescope in 2014 June. We note that the Raman-scattered O VI λ1032 at 6825 Å exhibits a triple-peak profile. Adopting an accretion disk model with an additional contribution from a collimated bipolar outflow, we attempt to fit the profile. We propose that the blue and central peaks are formed via Raman-scattering of O VI line photons from the accretion flow and that the bipolar flow is responsible for the remaining red peak. It is also noted that V455 Sco exhibits the Raman-scattered He II features blueward of H α and H β.