우리은하 및 외계행성

[구 GE-01] Dependence of Halo Properties on Galactic Potentials

Youngkwang Kim[1], Young Sun Lee[1], Timothy C. Beers[2]
[1]Department of Astronomy and Space Science, Chungnam National University, Daejeon 34134, Korea
[2]Department of Physics and JINA Center for the Evolution of the Elements, University of Notre Dame, Notre Dame, IN 46556, USA

We present the dependence of halo properties on two different Galactic potentials: the *Stäckel* potential and the Milky Way-like potential known as "Galpy". Making use of the Sloan Digital Sky Survey Data Release 12 (SDSS DR12), we find that the shape of the metallicity distribution and rotation velocity distribution abruptly changes at 15 kpc of $Z_{\max}$ (the maximum distance of stellar orbit above or below the Galactic plane) and 32 kpc of $r_{\max}$ (the maximum distance of an orbit from the Galactic center) in the *Stäckel*, which indicates that the transition from the inner to outer halo occurs at those distances. When adopting the *Stäckel* potential, stars with $Z_{\max}$ > 15 kpc show a retrograde motion of V_ϕ = -60 $km\,s^{-1}$, while stars with $r_{\max}$ > 32 kpc show V_ϕ = -150 $km\,s^{-1}$. If we impose V_ϕ < -150 $km\,s^{-1}$ to the stars with $Z_{\max}$> 15 kpc or $r_{\max}$> 32, we obtain the peak of the metallicity distribution at [Fe/H] = -1.9 and -1.7 respectively. However, there is the transition of the metallicity distribution at $Z_{\max}$ = 25 kpc, whereas there is no noticeable retrograde motion in the Galpy. The reason for this is that stars with high retrograde motion in the *Stäckel* potential are unbound and stars with low rotation velocity reach to larger region of $Z_{\max}$ and $r_{\max}$ due to shallower potential in the Galpy. These results prove that as the adopted Galactic potential can affect the interpretation of the halo properties, it is required to have a more realistic Galactic potential for the thorough understanding of the dichotomy of the Galactic halo.

[구 GE-02] Ca-CN Photometry of M5: A New Saga Begins

Jae-Woo Lee
Department of Physics and Astronomy, Sejong University

As a result of our decade-long effort, we developed a new approach wherein small-aperture telescope powered by ingeniously designed narrow-band filter systems can have the capability to measure not only the heavy but also the lighter elemental abundances of the red-giant branch (RGB) and asymptotic-giant branch (AGB) stars in the globular clusters. Our novel approach can complement the intrinsic weakness of the results from the prestigious instruments, such as HST and the VLT. In our talk, we will present the multiple stellar populations of the RGB and the AGB stars in M5, as a pilot work.

[구 GE-03] On an N-body exoplanet simulator

Hong Chaelin, Maurice H.P.M van Putten
Sejong university, Astronomy & Space science department

We present a general N-body exoplanet simulator in anticipation of upcoming next generation telescopes. Illustrative examples are presented on P-type orbits in stellar binary stellar systems, that should be fairly common as in Kepler 16AB. Specific attention is paid to reduced orbital lfetimes of exoplanets in the habitable zone by the stellar binary, known from Dvorak (1986).

[구 GE-04] Observational Constraints on the Formation of the Milky Way's Disk

Doori Han, Young Sun Lee, Youngkwang Kim, Timothy C. Beers
Department of Astronomy, Space Science, and Geology, Chungnam National University, Daejeon 34134, South Korea, 2Department of Astronomy and Space Science, Chungnam National University, Daejeon 34134, South Korea, 3Department of Physics & JINA-CEE, University Notre Dame, Notre Dame, IN 46556, USA

We present the derived kinematic characteristics of low-α thin-disk and high-α thick-disk stars in the Milky Way, investigated with a sample of about 33,900 G- and K-type dwarfs from the Sloan Extension for Galactic Understanding and Exploration (SEGUE). Based on the level of α -element enhancement as a function of [Fe/H], we separate our sample into thin- and thick-disk stars and then derive mean velocity, velocity dispersion, and velocity gradients for the U, V and W velocity