symbiotic stars are known to exhibit broad wings around Balmer emission line. We show high resolution spectra of S-type symbiotic stars, Z Andromedae and AG Draconis, obtained with the ESPaDOnS and the 3.6 m Canada-France- Hawaii Telescope, in which we find prominent broad wings around Balmer lines. We adopt Monte-Carlo technique to consider two types of wing formation mechanisms, which are Thomson scattering by free electron in H II region and Raman scattering by atomic hydrogen in H I region. We find that Thomson wings of Hα and Hβ have the same widths in the Doppler space due to the cross section independent of wavelength. In contrast, Raman Hα wings are 3 times broader widths than Hβ counterparts, which is attributed to the different cross sections and branching ratios. Our CFHT data show that Hα wings of Z Andromedae and AG Draconis are broader than Hβ wings, lending strong support to the Raman scattering origin of Balmer wings in these objects.

[포 SA-05] Chemical Abundance Analysis of Ultra Metal-Poor ([Fe/H] < -4.0) Stars

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We present preliminary results of elemental abundances of six ultra-metal poor (UMP; [Fe/H] < -4.0) stars derived from high-resolution spectra obtained by Gemini/GRACES. The UMP candidates were selected for the high-resolution follow-up from the low-resolution spectra of Sloan Digital Sky Survey (SDSS). We investigate possible progenitors of the UMP objects by comparing the measured abundance patterns with yields that various supernova models predict. Our results can provide stringent constraints on the mass range of the first generation of stars, which are the progenitors of the UMP objects.

[포 SA-06] Magellan High Resolution Spectroscopy of Raman-Scattered He II, C II and O VI Lines in the Symbiotic Nova RR Telescopii

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RR~Telescopii is a symbiotic nova exhibiting accretion activities through gravitational capture of the slow stellar wind from a Mira variable. We present high resolution spectra of RR~Tel obtained with MIKE and the 6.5 m Magellan-Clay telescope, in which we find broad features with FWHM exceeding 10 Å at 6545, 6825, 7082, 7023 and 7053 Å. They are formed through Raman-scattering with atomic hydrogen of far-UV He II 1025, O~VI 1032, 1038 Å and C II 1036 and 1037 Å. We compute the Raman conversion efficiencies using the case B recombination theory for He II emissions, which are used in turn to infer the intrinsic line luminosities of O VI and C II. The Raman O~VI features are characterized by double-peaked profiles with a peak separation ~ 60km/s, pointing out the presence of an accretion disk with a physical size of ~ sub AU. In contrast, Raman C II features exhibit profiles with a simple peak and a narrower width ~40 km/s, indicating that C II is formed in a much more extended region. The weak C II multiplet at 1335, 1336 Å found in the IUE spectral archive and the absence of C II 1036, 1037 Å in the FUSE archive show that far-UV C II lines suffer heavy interstellar extinction consistent with the distance of ~ 2.5 kpc to RR Tel.

천문우주관측기술

[포 AT-01] Flight model development of the NISS structure for NEXTSat-1 payload

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