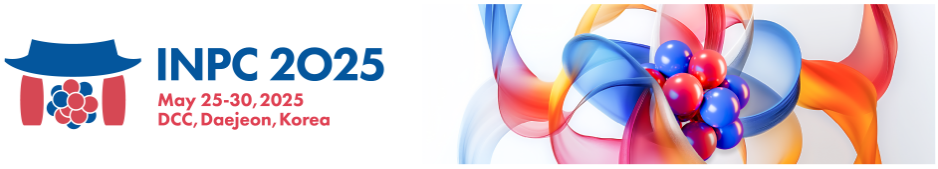

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Exploring the origin of neutron-capture elements through heavy-element enhanced metal-poor stars

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The origin of neutron-capture elements remains a mystery, but heavy element-enhanced metal-poor stars, as the natural laboratory that exists in the Universe, provide unique information to solve the mystery. We selected 84 very metal-poor stars with -3.3 < [Fe/H] < -1.6 based on a joint project with LAMOST and Subaru, and presented a homogeneous abundance analysis of 16 neutron-capture elements. 1) We find that the origin of r-I and r-II stars is related to their birth environment, while the s-process has already contributed to the chemical enrichment of the Milky Way galaxy at extremely low metallicity at [Fe/H]~-2.6. 2) We discovered for the first time an r-process enhanced actinide-boost star in the GSE substructure, whose complete abundance pattern can provide important information about the r-process nucleosynthesis in GSE. 3) The sample also includes two CEMP-r+s stars, which doubles the sample size of these very rare objects. We find a significant difference between CEMP-r/s and CEMP-r+s stars in the [ls/hs] and [Pb/Fe] distribution. This indicates that neutron-capture elements in these two types of stars may have their own unique origins, and will shed new lights concerning the puzzling origin of these elements.

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