HK 56: Hauptvorträge V

Zeit: Freitag 11:30–12:40 Raum: Plenarsaal

Hauptvortrag HK 56.1 Fr 11:30 Plenarsaal
Exotic, heavy element abundances in metal-poor dwarf galaxy stars — •Camilla Juul Hansen — MPIA Heidelberg

Explosions of various kinds create about half of all the heavy (Z>30) elements in the Universe. These heavy elements are locked up in low-mass stars, and the combinations of heavy material vary vastly from star to star, especially in the early Universe. Hence, we can use their chemical patterns as indirect evidence of the nature and physics of the long gone explosions possibly from the first stars. The first generation of low-mass stars typically resides in the Milky Way (MW) halo either as single halo field stars or engulfed dwarf galaxies. Sagittarius (Sgr) is a massive dwarf galaxy in the MW halo. Previous studies were restricted mainly to a few, metal-rich ([Fe/H]~-1) stars that suggested a top-light IMF. Here I present the first high-resolution, very metal-poor stellar sample in Sgr spanning metallicities from [Fe/H]=-1 to -3. We have derived abundances of 13 elements namely C, Ca, Co, Fe, Sr, Ba, La, Ce, Nd, Eu, Dy, Pb, and Th, where abundances of Sr, Pb, and Th are presented here for the first time. The high level of Ca indicates that more massive supernovae (SNe) must have existed and polluted the early ISM of Sgr before it lost its gas. This is in contrast with a top-light IMF with no massive star pollution. Our most metal-poor star ([Fe/H]~-3) indicates a pure r-process pollution. Based on star-to-star scatter and abundance patterns, a mixture of AGB stars and massive SNe (15-25Mo) are necessary to explain these. Hence, stars stripped from Sgr and similar dwarf galaxies could indeed be building blocks of the MW halo.

Hauptvortrag HK 56.2 Fr 12:05 Plenarsaal
Nuclear astrophysics with gas targets — •Konrad Schmidt — Institute of Nuclear and Particle Physics, TU Dresden, Germany

Nuclear astrophysics experiments will benefit from the development of next generation gas-target setups. The advantages of a localized, dense and pure target are discussed in detail by taking the example of the Jet Experiments in Nuclear Structure and Astrophysics (JENSA) windowless gas-jet target. JENSA enables the direct measurement of previously inaccessible reactions with radioactive ion beams provided by the rare isotope re-accelerator ReA3 at the National Superconducting Cyclotron Laboratory (NSCL) on the campus of Michigan State University (MSU), USA. The gas jet will be the main target for the Recoil Separator for Capture Reactions (SECAR) at the Facility for Rare Isotope Beams (FRIB). JENSA provides an unprecedentedly high number density of $\sim 10^{19}$ atoms/cm^2 and enables the direct measurement of various hydrogen and helium-induced astrophysical reactions.