



EINLADUNG

zum

VERA - SEMINAR

von

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Nuclear Astrophysics and AMS – probing nucleosynthesis in the lab

Nuclear astrophysics aims at describing nuclear processes relevant to nucleosynthesis. Besides the very light elements, the elemental abundance pattern of our solar system is the product of nucleosynthesis within many generations of stars. While the general isotopic pattern can be understood as the result of a few distinct processes, like s- or r-process for elements heavier than Fe, recent observations of very old, so-called ultra-metal-poor (UMP) stars indicate that our knowledge of nucleosynthesis still lacks in detail: abundance calculations fail in a certain mass-region, giving hint either to a systematic offset in experimental data, or to presently not considered more complex nucleosynthesis scenarios.

One important question to resolve such a discrepancy are measurements in the laboratory to benchmark the models used for nucleosynthesis calculations. Basic ingredients for understanding the isotopic pattern are cross sections in the relevant energy regimes for the various stellar scenarios. One solution to resolve the puzzle of nucleosynthesis given by UMP stars might be a systematic uncertainty in such measurements. AMS represents an independent and sensitive method for cross-section measurements compared to the conventional techniques when studying long-lived radionuclides.

An overview on recent activities of the AMS technique in nuclear astrophysics will be given and the actual measurement program at the VERA lab will be discussed: e.g. the search for live extra-terrestrial radionuclides in terrestrial archives (like r-process radionuclides deposited on Earth) as well as cross-section measurements relevant to nucleosynthesis. A planned experiment will be presented which aims helping to clarify the recently found discrepancy in UMP stars: Precise AMS measurements will be performed in comparison with other competing techniques to pin down possible unconsidered uncertainties.

Mittwoch, 07. Mai 2008, 16:30 Uhr

**1090 Wien, Währinger Str. 17, "Kavalierstrakt",
1. Stock, Seminarraum von VERA**