



INVITATION

for a

SPECIAL VERA SEMINAR

of

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Neutrons Underground

Some of the most critical reactions for the understanding of the synthesis of elements in stars are the stellar neutron sources. These are reactions that produce neutrons during certain phases of stellar burning, which in turn initiate slow neutron capture reactions (s-process) gradually building up heavier elements towards lead and bismuth. The s-process depends sensitively on the neutron flux or the strength of the neutron sources.

A measurement of these reactions in laboratory experiments is handicapped by the fairly large background from cosmogenic neutrons above ground. Therefore a number of initiatives have emerged, in Europe, the US, and China to study these reactions in a "background-free" environment, in deep underground accelerator facilities. Measurements of neutron background conditions demonstrated that there are substantial difference in the neutron background level, depending on the radiogenic background of the rock formation. In addition the experiments may be handicapped by beam induced background on low Z target impurities.

The accelerator facility CASPAR (Compact Accelerator System for Performing Astrophysical Research) has been built at the 4950 ft (~1500 m) underground level of the Homestake Mine in South Dakota as a pilot facility for measuring these neutron sources in a cosmogenic background free environment. The challenges and the status of this project and future facilities will be discussed and the outcome of first preparatory experiments will be presented.

Friday, 2. September 2016, 10:30 Uhr

**1090 Wien, Währinger Str. 17, "Kavalierstrakt",
1. Stock, Victor-Franz-Hess-Hörsaal**