



EINLADUNG

zum

VERA - SEMINAR

von

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Nuclear Physics with a laser: ^{229}Th

The radio isotope ^{229}Th shows a remarkable and unique property: it possesses an extremely low-energy excited (isomer) state of the nucleus which is expected around 7.6 eV. It might hence be possible to directly excite the atomic nucleus with UV (laser) radiation, creating a bridge between atomic and nuclear physics. The (expected) narrow line width of the transition makes it a promising candidate for a new frequency standard. The excellent shielding of the nuclear transition by the electron shell allows to implant ^{229}Th into UV transparent crystals and hence the realization of a solid state “nuclear atomic clock”. Furthermore, the nuclear transition shows a dramatic sensitivity to the exact value of the fine structure constant. A high precision measurement of the transition may therefore provide new constraints on possible drifts of fundamental constants.

In this presentation I will review the quest for the low-energy transition, discuss experimental approaches towards a new “nuclear” frequency standard and compare to existing schemes based on laser cooled or trapped atoms and ions. I will further discuss the possibility to measure drifts of fundamental constants using this new system.

Donnerstag, 18. März 2010, 16:30 Uhr

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