

# KIDS TALK

## “Isotope shifts and non-linearity of King plot in the search of New Physics”

**Speaker:** Anna Viatkina, Johannes Gutenberg-Universität Mainz

**Abstract:** The isotope shift (IS) phenomena in heavy atoms is an important way of probing various scenarios in nuclear physics and can aid the search for new physics beyond the Standard Model. It has been recently suggested to use the measurements of King plot non-linearity in a search for hypothetical new light bosons with spin-independent couplings to the electron and the neutron. On the other hand, one can find the non-linear corrections to the King plot arising already in the Standard Model framework.

We investigate contributions to the non-linearity of the relativistic effects in the field IS, of IS due to the nuclear polarizability and of the many-body effects. The relativistic effects are estimated through the derivation of a single-particle field IS formula for an arbitrary electron angular momentum. We then proceed with providing a rough analytical estimate of the non-linearity arising solely from the effect of a hypothetical scalar boson. Our predictions give theoretical limitations on the sensitivity of the search for new interactions and should help in selection of the most suitable atoms for corresponding experiments.

**When:** Friday, November 3<sup>rd</sup> 2017, **10:00 am**

**Where:** Room 46-387/388

\*\*\*\*\*COFFEE, TEA AND COOKIES WILL BE SERVED\*\*\*\*\*

All undergraduate and graduate students as well as postdocs are welcome and encouraged to join our discussion!



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