Title:

Prospects for radium molecules to search for new physics

Abstract:

Among the heavy elements there are exotic radioisotopes with have octuple deformed nuclei. The deformation enhances these isotope's sensitivity to new sources of time symmetry violation. The requisite nuclear spin for such an experiment generally makes these isotopes more unstable than their spin zero counterparts. Ion trapping and laser cooling provide an efficient means to work with small quantities of such trace isotopes. Radium ions are an option for utilizing (and producing) heavy radioactive molecules for such measurements, and are an attractive system in their own right. We will discuss our progress with radium-based molecular ions and their prospects for precision measurement in the low-numbers regime.