Towards Protactinium-229 and Radioactive Molecules in Solids

Jaideep Taggart Singh

Facility for Rare Isotope Beams and Michigan State University

Abstract:

Pear-shaped nuclei are expected to enhance the effects of parity and time-reversal symmetry violation by a few or more orders of magnitude. A high density of nuclei implanted in transparent cryogenic solids as either atomic ions or neutral molecules, where the internal electric field at the nucleus far exceeds that of typical laboratory electric fields, may be an efficient platform for searching for new symmetry violating physics. We'll describe our plans to calibrate the new physics sensitivity of Pa-229 and to quantify the efficiency of the production of neutral radioactive molecules using electrospray ionization.