**Idaho State University  
Physics Colloquium**

**World’s First Calcium Transverse Beam Asymmetry Measurement**Dr. Dustin McNultyPhysics Program  
Idaho State University

The PREX-II and CREX collaborations at Jefferson Lab, Newport News Virginia, have recently

measured the parity-conserving beam-normal single-spin asymmetry (or transverse beam

asymmetry: A n ) for several nuclear targets, including first ever measurements on 40 Ca and 48 Ca.

These measurements were auxiliary, meaning they were not the main motivating measurement

for the experiments; they were performed as a means to bound any potential contamination

from the process to the main physics measurement (the parity-violating asymmetry: A PV ). To

first order, or in the Born approximation, A n vanishes due to time-reversal invariance, however

in reality A n is tiny, but non zero, and can be relatively easily measured by parity violating

electron scattering experiments such as PREX-II and CREX. There is often much theoretical

interest in A n measurements since they give direct access to higher order scattering effects such

as from two-photon exchange amplitudes—which are largely unmeasured and unknown. This

talk will introduce the motivations for the measurements along with the apparatus and

techniques. Preliminary results will be given for new A n measurements on 12 C, 208 Pb, 40 Ca, and

48 Ca; they will be presented with previously published measurements from PREX-I as well as

with recent theoretical predictions.  
 **Monday, August 24, 2020**

**PS108**

**Or** [**Zoom**](https://isu.zoom.us/j/98955830438) **4:00 – 4:50 pm**