

CU Physics Department Colloquium

Monday, April 19, 2010 4:10 PM 428 Pupin Hall

"New measurements of persistent currents in normal metal rings"

One of the most remarkable predictions of the quantum theory of electronic circuits is that a small loop of resistive metal can have a perpetual current flowing through it in the absence of any applied voltage. This "persistent" current is directly analogous to the motion of electrons around the nucleus of an atom, and the prediction that it could be observed in realistic devices generated considerable excitement --- twenty five years ago. Since then, experiments in this area have produced confusing results at odds with theory and even with other experiments. To address this long-standing controversy we developed a new type of detector for persistent currents which offers much greater sensitivity and a less-invasive measurement than was previously possible. Our results have made possible a painfully detailed comparison between experiment and theory. I will describe these results, which seem to give the clearest picture yet of persistent currents in resistive metals.

Jack Harris, Yale University

Hosted by Boris Altshuler

