

Nuclear Science Division Colloquium

MeV to TeV Physics with Parity Violating Electron Scattering

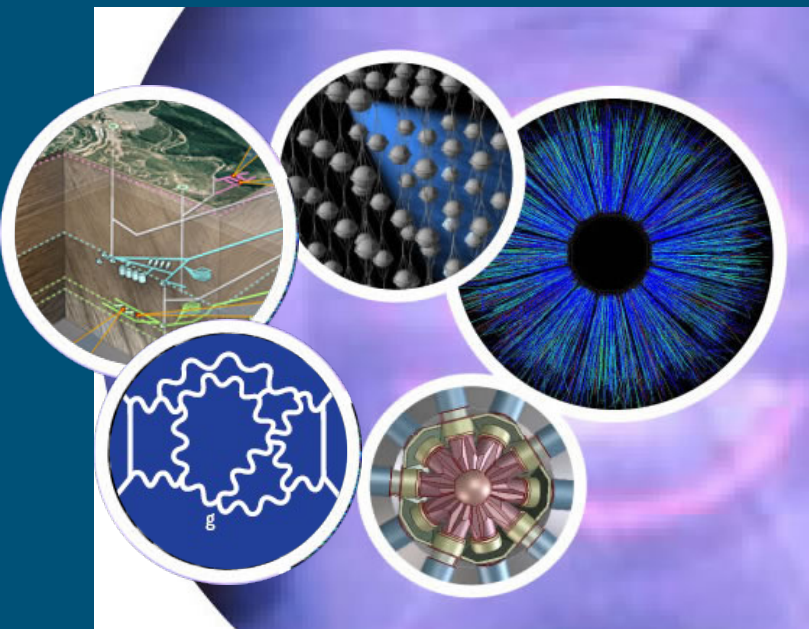
Prof. Krishna Kumar
U of Massachusetts

Wednesday

November 16, 2011

11:00 am

Bldg. 50-Auditorium



Abstract: The technique of parity-violating electron scattering, where the fractional difference in the scattering rate is measured for incident right- and left-handed longitudinally polarized high energy electrons on unpolarized targets, is now commonly used to isolate the weak neutral current amplitude at low momentum-transfer. The parity-violating asymmetries are small, but over the past three decades the technologies required to measure them accurately have steadily improved. It has thus become feasible to address a variety of fundamental questions in nuclear and particle physics: with judicious choices of kinematics and targets, various experiments have been designed to probe the role of virtual strange quarks in nucleon form factors, to measure the rms radius of the ground-state neutron distribution in a heavy, spinless nucleus, to measure nucleon structure functions in the valence region, and to test the gauge structure of the weak neutral current interaction itself, in a manner complementary collider experiments. The potential impact of new results and ongoing experiments will be reviewed and new projects for future accelerator facilities will be discussed.



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