Cyclotron Colloquium, Tuesday, August 23, 2011 3:45 pm
Refreshment will be served at 3:30 pm

A few new issues regarding the density dependence of nuclear symmetry energy

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Abstract:

The density dependence of nuclear symmetry energy is rather poorly known at both sub-saturation and supra-saturation densities. However, it is very important for understanding many interesting properties/phenomena/processes in nuclear structure, heavy-ion reactions and astrophysics. While recent studies have allowed us to put some significant constrains on the symmetry energy around normal nuclear matter density, many challenging issues related to constraining the symmetry energy at both sub-saturation and supra-saturation densities remain to be resolved. In this talk, in trying to understand why the density dependence of nuclear symmetry is still very uncertain and how we can constrain it more tightly, I will discuss (1) the relationship between the symmetry energy and nucleon optical potential; (2) the role of tensor force in determining both the kinetic and potential parts of the symmetry energy; (3) challenges of determining the symmetry energy of low density clustered matter including pairing and (4) effects of the super-strong magnetic field created in heavy-ion collisions on constraining the high-density symmetry energy using the ratio of charged pions.