**SPEAKER**:

Jacob Shapiro, Princeton University

**TITLE**:

The magnetic double-well eigenvalue splitting problem

**ABSTRACT:**
The ordinary double well eigenvalue splitting problem is a classical application of the WKB method in quantum mechanic textbooks. One studies a particle in a double-well potential with separation d and finds the ground state degeneracy is lifted by the non-perturbative order exp(-c lambda ——d——) where lambda is the depth of the potentials. The analogous problem where the particle is immersed in a homogeneous magnetic field has not been well-studied, despite being extremely useful for tight-binding approximations of topologically non-trivial models in solid state physics. We shall derive upper (easy) and lower (hard) bounds on this lowest eigenvalue splitting by controlling the probability of quantum tunneling. Based on joint work with C. L. Fefferman and M. I. Weinstein.