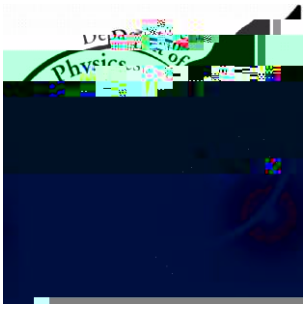

PHYSICS AND ASTRONOMY
COLLOQUIUM

Dr. Allan MacDonald

University of Texas at Austin

"Topological States in Graphene-Based Two-Dimensional Electron Systems"

Abstract

-zone corners. The band wavefunctions are conveniently described in a Bloch spin language in which the polar angle characterizes layer polarization and the azimuthal angle is equal to the momentum-dependent interlayer phase difference. The valence band pseudospin of bilayer graphene has a momentum space texture with vorticity equal to two. I will explain why this property makes graphene bilayers particularly susceptible to the formation of low-temperature broken symmetry states that have gaps in their charged excitation spectrum and broken layer inversion symmetry. The broken symmetry state can be viewed as one in which a core is formed in the momentum space vortex, turning the ground state into a type of Chern insulator which has a quantized anomalous Hall effect. I will d(a)-3(y)6(C)-4(h)21 10.18 42 x