

UCLA Department of Physics & Astronomy

COLLOQUIUM

Thursday, June 1 at 4 p.m.
1-434 PAB

Visualizing Helical Tunneling of Dirac Fermions

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Incorporating relativistic physics into quantum tunneling can lead to exotic behavior such as perfect transmission via Klein tunneling, or apparent faster than light travel. The realization of massless Dirac Fermions in topological materials has provided a new avenue to explore their properties. In this talk I will describe an experiment that demonstrates 'helical tunneling', a process where spin-polarized electrons can be transmitted in a nominally time-reversal invariant fashion. I will describe our experiments where we use nanowires of the topological Kondo insulator, SmB₆ to generate and measure spin-polarized currents of Dirac surface states. Our experiment demonstrates a new technique to probe spin properties of materials using the special tunneling properties of relativistic fermions and opens the door to the development of other nanowire based probes.

Refreshments at 3:30 p.m. on the PAB Patio. Undergraduates Welcome!