1011-53-187 **Christopher G Moseley*** (Chris.Moseley@usma.edu), Department of Mathematical Sciences, Thayer Hall, 646 Swift Road, West Point, NY 10996. *Geodesics of Sub-Riemannian Engel Manifolds.*

An Engel manifold is a four-manifold containing a 2-plane field D with the property that $[D, D]$ has rank 3 everywhere and $[D, [D, D]] = TM$. A theorem due to Chow shows that any pair of points in a connected Engel manifold can be joined by a piecewise smooth curve whose smooth segments are tangent to D, called a *D-curve*. If D is equipped with a sub-Riemannian metric, the manifold is called a *sub-Riemannian Engel manifold* and it is natural to ask whether a given D-curve is an extremal of the sub-Riemannian energy functional. These extremals are of interest to researchers in control theory as well as in geometry.

This presentation will focus on characterizing the regular sub-Riemannian geodesics and the special class of *rigid* curves which are extremals of the energy functional but admit no non-trivial C^1 variations, and also on examples from geometry and control theory. (Received August 25, 2005)