

Meeting: 1002, Pittsburgh, Pennsylvania, SS 12A, Special Session on Geometric Analysis and Partial Differential Equations in Subelliptic Structures

1002-53-145 **Scott D. Pauls*** (scott.pauls@dartmouth.edu), 6188 Bradley Hall, Department of Mathematics, Dartmouth College, Hanover, NH 03766. *Minimal and constant mean curvature surfaces in Carnot groups*. Preliminary report.

In this talk, we will discuss some new results concerning the geometric characterization of constant mean curvature surfaces in Carnot groups. We apply techniques due to Bryant, Griffiths and Grossman to the sub-Riemannian variational problems associated with the minimal and constant mean curvature equations (i.e. the minimization of surface area both with and without a volume constraint) to provide a new proof that smooth area minimizers subject to a volume constraint satisfy the sub-Riemannian constant mean curvature equation. Moreover, the derivation includes the description of a sub-Riemannian shape operator, providing a link between the solutions of this sub-elliptic equation and the geometry of the solution surfaces.

Applications include new obstructions to smooth solutions to the Plateau problem in these settings. (Received September 13, 2004)