1070-53-136 **Scott D. Pauls*** (scott.pauls@dartmouth.edu), 6188 Kemeny Hall, Dartmouth College, Hanover, NH 03755. *Minimal surfaces and models of the visual cortex.*

In 2004, G. Citti and A. Sarti provided a link between the minimal surface problem in sub-Riemannian model spaces and the disocclusion problem solved in the primary visual cortex. This provided a direct link between the growing literature on minimal surfaces in sub-Riemannian Lie groups and a physical problem in neuroscience.

In this talk, I will first discuss both the basic results in minimal surface theory in the so-called Carnot groups (sub-Riemannian nilpotent Lie groups) and the connection with the visual cortex. Second, I will demonstrate how mathematical results translate into neuroscience results through an analysis of certain optical illusions. (Received February 07, 2011)