1098-60-178 **Bruce K. Driver** (bdriver@math.ucsd.edu), **Nathaniel Eldredge*** (neldredge@unco.edu) and **Tai Melcher** (melcher@virginia.edu). *Hypoellipticity and heat kernels in infinite dimensions.*

A hypoelliptic diffusion process is, roughly, a process X_t which locally can only diffuse in certain directions, yet globally is still able to roam freely throughout its state space. For example, for each t, the random variable X_t may have a smooth positive density, which could be called a hypoelliptic heat kernel. Such processes have been extensively studied in $\mathbb{R}^n$ and finite dimensional manifolds and Lie groups.

In this talk, I'll describe a extension of this concept to infinite dimensions. Specifically, we construct a class of such processes on infinite-dimensional Lie groups modeled on abstract Wiener space, and are able to show that they have, in an appropriate sense, a smooth positive density. There is a vast body of knowledge about the analysis of Gaussian measures and abstract Wiener space, including the Malliavin calculus, and it appears that much of it may extend to these infinite-dimensional hypoelliptic heat kernels. I'll discuss some of the open questions that have arisen. (Received January 24, 2014)