



NIMBioS

National Institute for Mathematical
and Biological Synthesis

NIMBioS Special Seminar: “Evolution on the fitness landscape: A spectral approach to analysis and visualization”

**Dave McCandlish
NIMBioS Short-Term Visitor
Department of Biology, Duke University**

**Tuesday, October 26, 2010
11:00 a.m., Room 403B, Blount Hall, 1534 White Ave.**

Join NIMBioS for a special seminar with Short Term Visitor Dave McCandlish, who will be discussing the fitness landscape, which is used to visualize the relationship between genotypes and reproductive success. The fitness landscape is a classical concept in evolutionary biology, but the structure of the fitness landscape and its effects on evolutionary dynamics are difficult to understand because the space of genotypes is typically high-dimensional. McCandlish will present an approach to understanding evolution on the fitness landscape when mutation is weak so that evolution can be modeled as a Markov chain over the set of genotypes. It turns out that the eigendecomposition of the transition matrix describing this Markov chain provides a natural way of thinking about the effects of the fitness landscape on the evolutionary dynamics. This eigendecomposition also suggests a method for creating low-dimensional representations of fitness landscapes that can easily be applied to very large fitness landscapes. McCandlish will show and explore several of these visualizations.