1086-60-385   **Marc A Harper*** (`marcharper@ucla.edu`). *Inferring Fitness in Finite, Variably-Sized, Evolving, and Dynamically-Structured Populations.* Preliminary report.

Fitness is a critical concept in evolutionary biology, yet unlike many observables in the sciences, such as electrical current, fitness is a hidden quantity that cannot be measured directly. In this talk I will show how to apply Bayesian inference to estimate fitness in finite, variably-sized, evolving, and dynamically-structured populations described by stochastic processes on graphs similar to and including the Moran process. We will see that fitness is inferable from the population trajectory and how population structure affects the inference of fitness (along with videos of inference unfolding on simulated stochastic trajectories), and we will discuss new families of probability distributions developed for this analysis. Time permitting, we will discuss the impact of sampling, how to estimate the amount of information gained from observing a birth event, and computational challenges encountered in this work. (Received August 30, 2012)