1044-60-16 **Frederi G Viens*** (viens@purdue.edu), Dept. Statistics, Purdue University, 150 N. University St., West Lafayette, IN 47907, and **Tao Zhang** (tao.zhang417@yahoo.com). *Almost Sure Exponential Behavior of a Directed Polymer in a Fractional Brownian Environment.*

We will present an analysis of the almost sure exponential behavior for the stochastic heat equation driven by multiplicative infinite-dimensional fractional Brownian motion. The solution, expressed as the partition function of a polymer model in a Gaussian environment with medium or long memory, boasts a clear phase transition. The case of negatively-correlated increments, which is equivalent to medium memory and Hurst parameter less than 1/2, has the same qualitative properties, as measured by the existence of a positive and finite Lyapunov exponent, as when memory is absent. But in the case of long memory, this exponent is infinite, and we show that there is hope to find the proper exponential behavior. We use an almost-super-additivity condition, along with tools from the Malliavin calculus, and some classical arguments taken from the analysis of the stochastic Anderson model. (Received June 23, 2008)