1065-37-108 **Anthony Michael Bloch*** (abloch@umich.edu), Department of Mathematics, University of Michigan, 530 Church Street, Ann Arbor, MI 48109, and **Fred C Adams**. *Products of random matrices and the randomly forced Hill's equation.*

In this talk we derive expressions for the growth rates for the random 2 by 2 matrices that result from solutions to the random Hill's equation. The parameters that appear in Hill's equation include the forcing strength and oscillation frequency . The development of the solutions to this periodic differential equation can be described by a discrete map, where the matrix elements are given by the principal solutions for each cycle. Variations in the parameters lead to matrix elements that vary from cycle to cycle. We present an analysis of the growth rates including cases where all of the cycles are highly unstable, where some cycles are near the stability border, and where the map would be stable in the absence of fluctuations. For all of these regimes, we provide expressions for the growth rates of the matrices that describe the solutions. Applications to the dynamics arising from particle motion in a dark matter halos are discussed. (Received September 07, 2010)