

Abstract Submitted  
for the MAR07 Meeting of  
The American Physical Society

**Adaptation, Bacteria and Maxwell's Demons** PETER GALAJDA, JUAN E. KEYMER, ROBERT H. AUSTIN, Department of Physics, Princeton University — We propose a method to study the adaptation of bacterial populations with an asymmetric wall of Maxwell Demon openings. A Maxwell Demon opening is a funnel which is easier to enter than to leave. The interaction of swimming cells with such a Maxwell Demon Wall results in a population density separation, in apparent (but not real) violation of the Second Law of Thermodynamics, as we will show. Bacteria can be exposed to spatial challenges in order to move to e. g. higher food levels. The question we address in these experiments is: do the bacteria adapt and overcome the Maxwell Demon Wall?

Peter Galajda  
Department of Physics, Princeton University

Date submitted: 20 Nov 2006

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