1135-60-2421 **Timothy Chumley*** (tchumley@mtholyoke.edu) and **Renato Feres** (feres@wustl.edu).

Entropy production in random billiards and the second law of thermodynamics.

A random dynamical system is said to be time-reversible if the statistical properties of orbits do not change after reversing the arrow of time. The degree of irreversibility of a given system is captured by the notion of entropy production rate. We describe a general formula for entropy production that applies to a class of random billiard systems on Riemannian manifolds with boundary for which it is meaningful to talk about energy exchange between billiard particle and boundary. This formula establishes a relation between the purely mathematical concept of entropy production rate and physics textbook thermodynamic entropy. In particular, it recovers Clausius formulation of the second law of thermodynamics: the system must evolve so as to transfer energy from hot to cold. (Received September 26, 2017)