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03755. *Zeta Functions on Cocompact Arithmetic Subgroups of $SL(3, R)$* . Preliminary report.

In 1956, A. Selberg introduced a zeta function Z_Γ attached to a certain arithmetic subgroup Γ of $SL(2, R)$ that served to “count” closed geodesics; i.e., provide information on the length spectrum of an associated Riemannian symmetric space X_Γ . A later result due to Sarnak made use of a correspondence between Γ -conjugacy classes and closed geodesics on X_Γ to prove a “prime geodesic” theorem, as well as an unexpected theorem on class numbers in quadratic fields. These results were driven by an analysis of the Selberg Trace Formula, which provided a connection between the geometric and number-theoretic points of view. Much has been done to provide explicit trace formulae in more diverse settings, most notably in the case of connected semisimple Lie groups of rank 1. In this talk, we will use a trace formula in the $SL(3, R)$ setting to define an analogue to Selberg’s zeta function for certain arithmetic subgroups $\Gamma \leq SL(3, R)$. In the resulting analysis, we seek to count both closed geodesics and tori in a Riemannian symmetric space, and provide a bridge between the arithmetic properties of the group Γ and the geometric structure of the symmetric space. (Received September 26, 2006)