1093-53-318   **Jeffrey S. Meyer*** (`jmeyer@math.ou.edu`), Jeffrey S. Meyer, Department of Mathematics, University of Oklahoma, Norman, OK 73019-3103. *On the totally geodesic commensurability spectrum of arithmetic hyperbolic manifolds.*

Mark Kac famously posited in 1966, "can you hear the shape of a drum?" This question simply and elegantly summarizes our quest in spectral geometry to find collections of topological or geometric data that capture a Riemannian manifold's "geometric class." In this talk, we will report on recent work which shows that the collection of commensurability classes of totally geodesic submanifolds of an arithmetic hyperbolic manifold determines the commensurability class of the manifold. In addition to presenting the general results, we will present techniques used in their proofs, in particular the connections between the theories of quadratic forms over local and global fields and the Tits index of an algebraic group. This presentation will be concrete and contain many motivating examples. (Received August 19, 2013)