

ISOSPECTRAL MANIFOLDS FROM ORDERS IN QUATERNION ALGEBRAS

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Kac's catchy question "can you hear the shape of a drum" has surprisingly many points of contact with number theory. Like number fields, Riemannian manifolds have zeta functions, and two manifolds "sound the same" if and only if they have equal zeta functions, exhibiting a parallel with arithmetically equivalent number fields. A completely different connection with number theory is an automorphic construction of pairs of manifolds that "sound the same". The construction is originally due to Vigneras and dates back to 1980, but there are still many open questions surrounding it, chiefly among them: when does it actually do what it promises? I will report on progress, jointly with Aurel Page, on several of those open questions.