

The Mass of Riemannian Manifolds

Certain conformally invariant differential operators L have a well-defined mass function associated to it. If L is the Yamabe operator, its mass is related to the ADM mass of an associated asymptotically flat spacetime, and one expects positive mass theorems in various settings. The is also related to the zeta-regularized trace of the inverse of L , and we compare the supremum of this trace over the conformal class between different manifolds. The result is that in certain even dimensions, this trace is minimized on the standard sphere, while in other cases, it is maximized there, a behavior similar to the determinant of such operators.