

**ZERO AND NEGATIVE EIGENVALUES OF CONFORMALLY
COVARIANT OPERATORS, AND NODAL SETS IN CONFORMAL
GEOMETRY**

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In this paper, we study conformal invariants that arise from nodal sets and negative eigenvalues of conformally covariant operators, which include the Yamabe and Paneitz operators. We give several applications to curvature prescription problems. We establish a version in conformal geometry of Courant's Nodal Domain Theorem. We prove that the Yamabe operator can have an arbitrarily large number of negative eigenvalues on any manifold of dimension $n \geq 3$. We show that 0 is generically not an eigenvalue of the conformal Laplacian. If time permits, we shall discuss related results for weighted graphs.

This is joint work with Y. Canzani, R. Gover, R. Ponge, A. Hassannezhad, M. Levitin.