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Canonical metrics on singular spaces Open Problems

1. Characterize the case of equality in the stratified Yamabe problem: If M is a stratified space and

$$Y(M, g) = Y_{\text{loc}}(M, g),$$

then is g necessarily conformal to a metric with special holonomy?

2. Find effective estimates for the suspended Yamabe invariants $Y(Z \times \mathbb{H}^k)$ when Z is a compact stratified space – or even when Z is just a compact smooth manifold.
3. Let (M, g) be a compact Kähler-Einstein metric which has a crossing edge singularity along a general divisor with simple normal crossings $D \subset M$ with cone angle $2\pi\beta$. Characterize the maximal value of $\beta \in (0, 1)$ for which such a metric exists. Said differently, study convergence properties of these metrics as the cone angle $2\pi\beta_j$ converges monotonically upward.