Abstract

In this talk, I first present some Perelman type differential Harnack inequalities for the heat kernels and W-entropy formulas for the positive solution of the heat equation on complete manifolds with negative Ricci lower bound. Then, I will discuss some on-going results for Li-Yau type differential Harnack inequalities and Perelman type W-entropy formulas for the Witten Laplacian on complete manifolds with negative Bakry-Emery curvature lower bound.