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*On nonexistence and existence of positive solutions to semilinear elliptic and parabolic problems on manifolds*

We determine the critical exponent for certain semi-linear elliptic problem on Riemannian manifolds assuming the volume regularity and Green function estimates. By using a sharp volume condition, we also reinvestigate nonexistence and existence of global positive solutions to semilinear parabolic equation on Riemannian manifolds. This talk is based on joint works with Prof. Grigor'yan, and Fanheng Xu.