Isotropic curvature, macroscopic dimension and fundamental group

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Abstract:

I will discuss the proof a conjecture of Gromov's to the effect that manifolds with uniformly positive isotropic curvature (and with Ric bounded from below) are macroscopically 1-dimensional on the scale of the isotropic curvature. One of the main techniques involved is modeled on Donaldson's version of Hormander technique to produce (almost) holomorphic sections. We use this to produce destabilizing sections of the restriction of the complexified tangent bundle of M to a stable embedded minimal disk. As a consequence we prove that compact manifolds with positive isotropic curvature have virtually free fundamental groups.