Theoretical Statistics and Mathematics Unit

Monday Colloquium

Date: December 12, 2016 Time: 4:15 PM

Venue: L-Infinity, Stat-Math Unit (5th Floor, A.N. Kolmogorov Bhavan)

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Taut foliations in 3-manifolds

Abstract

Every 3-manifold has a foliation by 2-dimensional manifolds (called leaves). A foliation is called taut if there exists a simple closed curve in the manifold that intersects each leaf of the foliation transversally. A surface bundle over a circle is the simplest example of a 3-manifold with a taut foliation. Every 3-manifold can be obtained from a surface bundle by Dehn filling the boundary components (with solid tori). We have proved that the fiber structure of a surface bundle can be perturbed to taut foliations realizing all rational boundary slopes in a neighbourhood of the the boundary slopes the fiber. This allowed us to prove that 3-manifolds obtained by Dehn-filling a surface-bundle along slopes sufficiently close to the slopes of the fiber produce closed 3-manifolds that contain taut foliations. In other words, closed 3-manifolds that are 'near' closed surface bundles (in terms of the Dehn-filling slopes) also have taut foliations.

All are cordially invited