Spaces of Geometric Structures

Gabe Lumpkin

George Mason University

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glumpkin@gmu.edu

Topologically, surfaces are classified by their genus; two tori are always topologically equivalent. However, when it comes to endowing surfaces with a local *geometric structure,* there are many, in fact uncountably many, different "geometric" tori. For a fixed surface Σ when are two geometric structures for Σ equivalent? How can one determine how different two structures are?

The purpose of this talk is to introduce the notion of geometric structures on manifolds. This will be presented in a way which lends itself to discussing the space of geometric structures for a particular surface. This will be done via the construction of the developing and holonomy maps for a (G,X)- manifold. This allows one to discuss the space of geometric structures as a subspace of the character variety, $Hom(\pi_1(\Sigma), G)/G$, which inherits its topology from that of G^{2g}.