



Mathematics Colloquium

Using hyperbolic geometry to obtain
information on knots, links and
3-manifolds

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Abstract

Knots, links and three-dimensional manifolds have been an object of mathematical studies since the 19th century. However, only in the 1970's William Thurston noticed that three-dimensional manifolds can be approached using geometry. This new perspective made geometric topology develop rapidly, and allowed to solve the long-standing Poincaré conjecture. Soon it was realized that one particular type of manifolds is prevalent and the least understood: the hyperbolic manifolds. Moreover, the hyperbolic metric on many three-dimensional manifolds is unique and therefore it gives rise to powerful invariants. The talk will briefly introduce an approach to hyperbolic structures that provides a close connection with a combinatorial or topological description of a manifold. I will then outline recent results giving an insight into the interplay between the intrinsic geometry of hyperbolic 3-manifolds and the invariants coming from other areas of mathematics, such as quantum topology, number theory and algebraic geometry.

Monday, 01 February 2016, 4pm

Smith Hall 204

Tea and refreshments will be served at 3:45pm.