Welcome to International Group Theory Web Seminar

Maurice Chiodo (The University of Melbourne),

"The value of information in algebraic and geometric decision problems"
June 10, 11:00am (New York Time).

Abstract:

Without any additional data, it is algorithmically impossible to determine (in general) if a finitely presented group is trivial, or a free product, or a subgroup of another finitely presented group. It is also impossible to determine if a word represents the trivial element. Such results can be carried over to geometry; it is impossible to recognise if a closed 4-manifold is simply connected, or if a pair of such manifolds are homeomorphic.

I will discuss some results relating to the above questions, where additional information is known. For finitely presented groups: it is impossible to explicitly construct a splitting of a free product, it is impossible to explicitly construct an embedding from one group into another in which it embeds, and it is impossible to explicitly select a non-trivial generator from a non-trivial group. For closed 4-manifolds: it is impossible to explicitly split a connect sum of two non-simply connected manifolds, and it is impossible to explicitly construct a loop representing a torsion element in a manifold whose fundamental group has torsion.

Next presentation: TBA

Algebraic Cryptography Center