

Welcome to International Group Theory Web Seminar

Dan Segal (University of Oxford),
"Profinite groups: algebra and topology"
April 29, 12:00pm (New York Time).

Abstract:

Profinite groups arise in nature as Galois groups of infinite algebraic extensions. But they have an interesting theory in their own right, and this talk is about one aspect of it. A profinite group is a compact topological group that is built out of finite groups. The properties of the topological group reflect group-theoretic properties of all the finite groups; if we forget the topology we wouldn't expect this to remain true, and it doesn't in general. However, it does in an important special case (where the profinite group is topologically finitely generated). This surprising result (proposed by Serre in the 1970s, proved in 2007) is related to algebraic properties of finite groups, specifically the behaviour of word-values in these groups.

An example of the kind of property that is relevant is the following recent theorem: Given natural numbers d and q , there exists f such that in any d -generator finite group, every product of q th powers is equal to a product of f q th powers. The proofs are hard and depend ultimately on the classification of finite simple groups. Interesting questions include: to what extent do results like this hold for other group words? This is equivalent to asking which verbal subgroups are necessarily closed in every finitely generated profinite group.

Next presentation:

May 6. TBA

