CONFERENCIANTE SANTALÓ 2002

La Facultad de Ciencias Matemáticas, en colaboración con la Revista Matemática Complutense han creado la figura del *conferenciante Santaló.* Tal título recaerá cada año en un profesor invitado (a propuesta del Consejo Editoral de la Revista y ratificado por la Junta de Facultad) para que envíe a la Revista un trabajo y dé una conferencia general, tipo colloquium, sobre el mismo (aparte de otros seminarios más especificos que pueda dar). El conferenciante Santaló para este año es

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que dará la conferencia

The geometry of abstract groups and their splittings

(lunes, 7 de Octubre a las 16'00 en el aula S-117)

Abstract

Given a discrete group G, we can find a topological space X on which G acts freely, and then use homotopy invariants of X/G to define invariants of G: cohomology groups, cohomological dimension (c.d.), and the condition PD^n for G to satisfy Poincaré duality.

Alternatively, we can use a finite set S of generators to define a metric on G itself, and study the coarse geometry of G as a metric space; e.g. G is quasi-isometric to the Cayley graph $\Gamma(G, S)$. Invariants from this viewpoint include the number $e(G)$ of ends; more precisely the space of ends.

An expression of a group G as an amalgamated free product, or as a graph of groups, is known as a splitting of G. More geometrically, it was shown by Serre that splittings correspond to actions of G on trees.

A decisive result of Stallings was that if $e(G) > 1$ then G acts on a tree with the stabiliser of each edge a finite subgroup. One corollary is that if $c.d.G = 1$ then G is free. The result led also to a proof that any PD^2 group is the fundamental group of a closed 2-manifold.

There is an analogy between group splittings of this nature and splittings of manifolds by codimension 1 submanifolds. This has led to an active area of research establishing a number of analogues in pure group theory of the JSJ decomposition of compact oriented 3-manifolds. Sela made a spectacular application of one such theorem, giving a decision procedure for the isomorphism problem for torsion-free hyperbolic groups that do not act on R-trees, and hence for the homeomorphism problem for closed negatively curved manifolds of dimension ≥ 5.

Nota: El martes, miércoles y jueves de la misma semana habrá conferencias más específicas, que se anunciarán oportunamente.