DEPARTAMENTO DE
GEOMETRIA Y TOPOLOGIA

Curso

Programa de Matemática Pura Intertemática

Instituto de
Matemática
Interdisciplinar

Mike Hilden

University of Hawaii

The Mapping Class Group and its Applications

We begin by giving two different definitions of the *braid group* of a disc, and we show the two are equivalent. We define the *mapping class group* of a closed surface and we introduce two dimensional branched covering space techniques which we use to define a homomorphism from the braid group to the mapping class group.

We then cover **W.B.R. Lickorish**'s three papers in which he defines a finite set of generators for the mapping class group of a surface. Branched covering space techniques are used to simplify Lickorish's proofs.

We use the Lickorish generators to prove the theorem, due to **Hilden, Hirsch** and **Montesinos,** that every closed oriented three manifold is a simple threefold branched covering of the three sphere with branch set a knot. We introduce the *colored knot techniques* of **Ralph Fox.**

Finally we explain the role of the mapping class group in *Teichmuller space theory*.

HORARIO: MARTES Y JUEVES, A LAS 16:00 H.

Organizado por los proyectos de investigación *Teoría de la forma* (MTM2006-0825), *Geometría Real* (MTM2005-02865) y los grupos de investigación UCM-CM *Teoría de la Forma y Dinámica Topológica* y *Geometría Algebraica y Analítica Real*, el departamento de *Geometría y Topología,* y el *Instituto de Matemática Inter-*

15 Junio - 15 Julio de 2008

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