



DEPARTAMENTO DE
GEOMETRÍA Y TOPOLOGÍA



Curso

Postgrado en Investigación Matemática

Hugh Morton
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Knots, satellites and algebra

1. General introduction to knots and links as closed curves in Euclidean space, defined up to physical manipulations as stretchable rope. Diagrammatic methods for dealing with invariants of knots. Linking number of curves and use of Seifert surfaces. Construction of satellites of a knot based on patterns in a solid torus.
2. Introduction to the Homfly polynomial of a knot or link. Its relation to other knot invariants and its use in conjunction with satellites. The defining skein relations for the Homfly polynomial will be used to derive a number of linear spaces, known as skeins, from knot diagrams in suitably chosen surfaces. These include combinatorial models for the Hecke algebras of type A, and the important skein of the annulus, which parametrises the Homfly satellite invariants.
3. Further combinatorial work on the Hecke algebras and the skein of the annulus. Algebra structure. The meridian map and other geometrically defined endomorphisms of the skein of the annulus and their eigenvectors, leading to a very useful basis.
4. Symmetric functions in the context of the skein of the annulus. Schur functions and the basis of eigenvectors. Interpretations as the representation ring of the $Sl(N)$.
5. Quantum group knot invariants. Relations between $Sl(N)$ quantum invariants and Homfly satellite invariants. Brief discussion of finite type invariants.

HORARIO: A partir de las 16.00 H.

Organizado por el Departamento de Geometría y Topología de la UCM, y el IMI.
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Seminario de Geometría y Topología
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