

ABSTRACTS

KNOTS in WASHINGTON II

The Second Miniconference on Knot Theory and its Ramifications will be held on Saturday, March 30, 1996 at the George Washington University.

10:30 - 11:30 Ken Millett, Physical Knots

Abstract. I would discuss results on polygonal knots, knot energies, and thickness of knots.

12:00 - 1:00 Jeff Weeks, What is a hyperbolic knot?

Abstract.

The talk will give a gentle introduction to the theory of hyperbolic knots. The computer program SnapPea will illustrate the main ideas.

2:30 - 3:30 Wilbur Whitten, Knot inversion and the isometry groups of hyperbolic 3-manifolds

Abstract:

The problem of deciding whether a given knot K in the 3-sphere is invertible is shown to be equivalent to deciding when two knot groups are isomorphic. These are the groups of two satellite knots formed with K as their (only) maximal companion, and each of these satellite knots is itself noninvertible regardless of the invertibility status of K . This result shows clearly why the invertibility question of a knot is generally so difficult and it coincidentally leads to three conjectures (too lengthy to include in this abstract) concerning the isometry groups of the hyperbolic 3-manifolds obtained by surgery on hyperbolic links. If these conjectures are correct, such an isometry group would be one of a well-defined finite collection.

3:45 - 4:10 Yongwu Rong, Introduction to Higher Order Link Polynomials

Abstract:

Two major link invariants are Homfly+PT polynomial and the Vassiliev invariants. We introduce what we call "higher order link polynomials" that combine ingredients from both. We carry out a detailed study for the order one polynomials. Various possible applications will be discussed.

4:20 - 4:45 Jozef H. Przytycki, What is new in skein modules?

Abstract:

Skein modules are the basic objects of algebraic topology based on knots (as homology and homotopy groups are the basic objects of a classical algebraic topology). The last half a year brought big progress in the theory (which is 9 years old). It will be illustrated by an example of detecting torsion in the Kauffman bracket skein modules using an $SL(2, \mathbb{C})$ character variety and hyperbolic geometry.

4:55 - 5:20 Adam Sikora, Skein algebra of a handlebody from the point of view of algebraic geometry

Abstract:

This talk will be mainly concerned with a non-standard 'algebraic topology' built on knots. In particular, we will define $\{ \text{it the Kauffman bracket skein module} \} \mathcal{S}(M)$, a module associated to any 3-dimensional manifold M . A particular version of this module has a structure of a commutative algebra and therefore it is called a $\{ \text{it skein algebra} \}$. The skein algebra depends only on the fundamental group of a manifold.

We are going to investigate skein algebras using methods of algebraic geometry. In particular, we will show how the skein algebra associated to a manifold M is connected with a $\{ \text{it character variety} \}$, an algebraic set representing all traces of homomorphisms of $\pi_1(M)$ into $SL_2(\mathbb{C})$. This will give a very nice geometric interpretation of character varieties, which essentially have been investigated since the time of Poincare, Fricke and Klein.

5:30 - 5:50 Michael McDaniel, Cablings of Vassiliev Invariants

Abstract:

We will study Vassiliev Invariants coming from cabling and describe a practical way of calculating them.

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