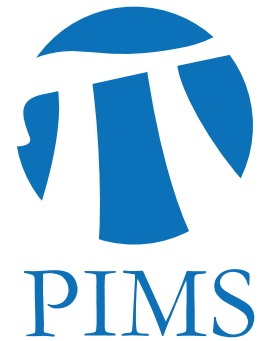


ABC Algebra Workshop

Pacific Institute for the Mathematical Sciences
University of Calgary Site Office



Abstracts

Saturday, April 18th, 2009

Matthew Greenberg (University of Calgary)

Title: Computing in the cohomology of quaternionic unit groups.

Abstract: In this talk, we will discuss methods for enumerating Hilbert modular forms by computing in the cohomology of unit groups of orders in indefinite quaternion algebras. These tools are applied to the construction of a nonsolvable number field ramified only at 3. This is joint work with John Voight.

Paul Buckingham (University of Alberta)

Title: The fractional Galois ideal and class-groups.

Abstract: The analytic class number formula is a classical, though still remarkable, connection between the ζ -function of a number field and the order of the class-group of that field. It is natural to ask if it is possible to use generalizations of ζ -functions, ie L -functions, to extract deeper algebraic information about the class-group. We will see that, assuming a conjecture of Rubin which is known in many cases, a certain "fractional ideal" over a Galois group-ring does just this, giving the so-called Fitting ideal of the class-group.

Jason Bell (Simon Fraser University)

Title: Automorphisms of projective varieties and noetherian algebras.

Abstract: We look at the following problem: Let X be a quasi-projective complex variety and let σ be an endomorphism of X . If $x \in X$ and Y is a subvariety of X , what can be said about the intersection of the orbit of x under σ with Y ? As it turns out, in many cases we can infer that either the intersection must be finite or Y has a subvariety that is stable under some iterate of σ . We apply this theorem in a few different settings and show its connection to noetherian algebras. This is joint work with Dragos Ghioca and Tom Tucker.

Hadi Salmasian (University of Windsor)

Title: Character sheaves on nonarchimedean fields and representations of p -adic groups.

Abstract: We give a geometric interpretation of characters of certain supercuspidal representations of p -adic groups, namely in terms of the characteristic function of certain character sheaves. Our results rely on Lusztig's work on the characters of finite reductive groups. The key idea that connects finite fields and local fields is Deligne's nearby cycles functor.

Nicholas Guay (University of Alberta)

Title: Representations of double affine Lie algebras.

Abstract: After introducing Lie algebras attached to a rank one rational Cherednik algebra, I will present results related to three kinds of representations of such algebras: integrable highest weight modules, Weyl modules and quasi-finite highest weight modules. In the first and third case, I will present a criterion for integrability and quasi-finiteness, whereas, in the second case, I will give lower bounds for the dimension of certain Weyl modules.

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Abstracts

Sunday, April 19th

Veronique Godin (University of Calgary)

Title : A infinity algebras and string topology invariants.

Abstract : I'll start by covering a classical example of an algebra up to homotopy. I'll then move on to constructing a string-topology invariant and some interesting computations.

Charles Weibel (Rutgers University)

Title: The Bloch-Kato Conjecture is now a theorem.

Abstract: Milnor conjectured in 1970 that the étale cohomology of a field (mod 2 coefficients) should have a presentation with units as generators and simple quadratic relations (the ring with this presentation is now called the "Milnor K-theory"). This was proven by Voevodsky, but the odd version (mod p coefficients for other primes) has been open until recently, and has been known as the Bloch-Kato Conjecture.

Using certain norm varieties, constructed by Rost, and techniques from motivic cohomology, we now know that this conjecture is true. This talk will be a non-technical overview of the ingredients that go into the proof, and why this conjecture matters to non-specialists.

Donald Stanley (University of Regina)

Title: Invariants of t-structures.

Abstract: Let R be a commutative Noetherian ring. Consider a chain complex M of R -modules. We can truncate M so that all the homology above a certain degree is 0. This is the simplest example of a t-structure. More generally a t-structure is a kind of truncation on $D(R)$, the derived category of R . In this talk we describe invariants of t-structures, given in terms of functions from the integers to the prime ideal spectrum of the ring. When restricted to a natural finite subcategory of $D(R)$, this invariant is complete. In fact if R has a dualizing complex we get a classification of the t-structures. On the other hand on all of $D(R)$ the t-structures can form a proper class. During the talk we will also discuss the connection between t-structures, thick subcategories and some ideas from stable homotopy theory.