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Sommersemester 2018

Arithmetische und Algebraische Geometrie

Mittwoch 16-18, Theresienstr. 39, B 251

11.4.2018 Kazim Buyukbodak, Koc University.

Title: "p-adic Gross-Zagier formula at critical slope and a conjecture of Perrin-Riou"

Abstract: I will report joint work in progress with R. Pollack and S. Sasaki, where we prove a critical slope p-adic Gross-Zagier formula for critical slope p-adic L-functions. Besides the strategy for our proof, I will illustrate a number of applications. The first of these is the proof of a conjecture of Perrin-Riou (that predicts an explicit relation between Beilinson-Kato elements and Heegner points). The second is towards a Birch and Swinnerton-Dyer formula when the analytic rank is one (yielding a simplified proof of the recent results of Jethchev-Skinner-Wan in this context).

18.4.2018 Javier Fresan, Ecole Polytechnique.

Title: "Exponential motives"

Abstract: (Joint work with Peter Jossen). What motives are to algebraic varieties, exponential motives are to pairs consisting of an algebraic variety X over some field k and a regular function f on X . In characteristic zero, one is naturally led to define the de Rham and rapid decay cohomology of such pairs when dealing with numbers like the special values of the gamma function or the Euler-Mascheroni constant which are not expected to be periods in the usual sense. Over finite fields, the étale and rigid cohomology groups of these pairs play a pivotal role in the study of exponential sums. Following ideas of Katz, Kontsevich, and Nori, we construct a Tannakian category of exponential motives when k is a subfield of the complex numbers. This allows one to attach to exponential periods a Galois group that conjecturally governs all algebraic relations among them. The category is equipped with a Hodge realisation functor with values in mixed Hodge modules over the affine line and, if k is a number field, with an étale realisation related to exponential sums.

25.4.2018 Paul Truman, Keele University.

Title: "Commutative Hopf-Galois module structure of tame extensions"

Abstract: We study some of the applications of nonclassical Hopf-Galois structures to finite extensions of p-adic fields which are at most tamely ramified. In particular, we prove that if L/K is a finite tame Galois extension of p-adic fields which is Hopf-Galois for a commutative Hopf algebra H then each fractional ideal of L is a free module over its associated order in H . We also investigate generalizations of this result to the case in which L/K is non-normal.

2.5.2018 Andreas Rosenschon, LMU.

Title: "Motivic cohomology of arithmetic schemes"

- 9.5.2018 Masato Kurihara, Keio University.
 Title: ‘Generalized Stark elements and their integral properties (joint work with D. Burns and T. Sano)’
- 23.5.2018 Sudhanshu Shekhar, Indian Institute of Technology, Kanpur.
 Title: “Non-commutative Twisted Euler characteristic in Iwasawa theory”
 Abstract : It is well known that for a finitely generated torsion module M over the Iwasawa algebra $\mathbb{Z}_p[[\Gamma]] \cong \mathbb{Z}_p[[X]]$, there exists a twist $M \otimes_{\mathbb{Z}_p} \rho$ of M by a continuous p -adic character ρ of Γ such that the U -Euler characteristic is finite for every open subgroup U of Γ . We prove a generalization of this result by considering modules over the Iwasawa algebra of a general p -adic Lie group G , instead of Γ . This is a joint work with Somnath Jha.
- 13.6.2018 K.V. Shuddhodan, FU Berlin.
 Title: “Self maps of varieties over finite fields”
 Abstract: Esnault and Srinivas proved that as in the case of de Rham cohomology over the complex numbers, the value of the entropy of an automorphism of a smooth proper surface over a finite field \mathbb{F}_q is taken in the span of the Neron-Severi group inside ℓ -adic cohomology. In this talk we will discuss some analogous questions in higher dimensions motivated by their results and techniques.
- 14.6.2018 Thomas Peterzell, Universität Bayreuth (im Kolloquium).
 Title: “The Miyaoka-Yau inequality, non-abelian Hodge correspondence and uniformization of manifolds of general type”
- 20.6.2018 Wolfgang Bliemetsrieder, LMU.
 Title: “Berechnung von Erzeugern von freien Moduln ber Ordnungen in Matrixalgebren Vortragender”
 Abstrakt: Herr Bliemetsrieder wird im Rahmen des Oberseminars ber die Ergebnisse seiner Masterarbeit vortragen.
- 27.6.2018 Nikita Semenov, LMU.
 Title: “Applications of the Morava K-theory to algebraic groups and quadrics - Part 1”
- 11.7.2018 John Ottem, University of Oslo.
 Title: “The Integral Hodge conjecture for 3-folds of Kodaira dimension 0”
 Abstract: The Hodge conjecture predicts which rational cohomology classes on a smooth complex projective variety can be represented by linear combinations of complex subvarieties. The integral Hodge conjecture, the analogous conjecture for integral homology classes, is known to be false in general (the first counterexamples were given in dimension 7 by Atiyah and Hirzebruch). I’ll give a short survey talk on this conjecture, and present some new counterexamples in dimension three. This is joint work with Olivier Benoist.