Prof. Dr. Werner Bley
Prof. Dr. Cornelius Greither
Prof. Dr. Gregor Kemper
Prof. Dr. Markus Land
Prof. Dr. Andreas Nickel
Prof. Dr. Andreas Rosenschon

Wintersemester 2025/26

Arithmetische und Algebraische Geometrie

Mittwoch 16-18, LMU Theresienstr. 39, Raum B251 oder TUM, Garching, Boltzmannstr. 3, Raum 02.08.020 oder UniBw

15.10.2025 .
Title:
Abstract:

22.10.2025 Alexandros Galanakis (UniBw).
Title: Adelic Eisenstein Classes and Applications to Stickelberger Elements
Abstract: We construct an adelic refinement of Nori's Eisenstein cohomology classes and their integral version due to Beilinson, Kings, and Levin. This adelic perspective provides a natural and unified framework for studying integrality properties of special L-values and leads to new divisibility results for Stickelberger elements. This is joint work with Michael Spiess.

29.10.2025 .
Title:
Abstract:

05.11.2025 .
Title:
Abstract:

12.11.2025 Guillermo Gamarra Segovia (Essen)
Title: Extension of Eisenstein-Kronecker classes and a new construction of Katz's p-adic Eisenstein measure
Abstract: In order to study the algebraicity of special values of Hecke L-functions, one approach is to construct p-adic measures interpolating these values. This was used by Katz in the case of certain Hecke characters associated to CM fields, where he constructed a p-adic measure whose moments are given by a generalization of the classical Eisenstein series to Hilbert modular forms. On the other hand, work of Kings-Sprang showed a more general integrality result through the construction of Eisenstein-Kronecker classes: special classes of equivariant cohomology of an abelian scheme with coefficients in the completion of its Poincar bundle. Moreover, they also were able to construct p-adic measures from these classes. In this talk, I will discuss the main contents of my PhD thesis, in which I generalize the construction of these Eisenstein-Kronecker classes to Hilbert moduli spaces, and prove that the p-adic measure obtained from them recovers the Eisenstein measure constructed by Katz.

19.11.2025 .
Title:
Abstract:

26.11.2025 Markus Land (LMU)
Title: The homotopy limit problem in Grothendieck-Witt theory
Abstract: Grothendieck-Witt theory is the K-theoretic study of projective modules (or vector bundles or perfect complexes) equipped with a unimodular form. It has been known for a long time that this theory is well-understood if 2 is invertible in the base ring, or if one inverts 2 on the outside, that is, consider GW-theory with 2-inverted coefficients. Two access the 2-local information, Thomason proposed to study a comparison map from Grothendieck-Witt theory to C_2-fixed points of algebraic K-theory; this map has been shown to be a 2-adic equivalence for many rings/schemes in which 2 is invertible. The goal of this talk is to explain to what extent this result holds for rings/schemes in which 2 need not be invertible which is joint work with Akhil Mathew. After explaining some of the background to the whole story, I will focus on the case of fields of characteristic 2.

03.12.2025 Martí Roset Julià (Paris).
Title: Rigid classes for $\mathrm{SL}(n)$ and their values at special points.
Abstract: The theory of complex multiplication implies that the values of modular functions at CM points belong to abelian extensions of imaginary quadratic fields. In this talk, we propose a conjectural extension of this phenomenon to the setting of totally real fields. Generalizing the work of Darmon, Pozzi, and Vonk, we construct rigid cocycles for $\mathrm{SL}(n)$, which play the role of modular functions, and define their values at points associated with totally real fields. The construction of these cocycles originates from a topological source: the Eisenstein class of a torus bundle. This is ongoing joint work with Peter Xu.

10.12.2025 Dmitry Krekov (ETH Zrich)
Title: Factorisation of p-adic Asai L-function of a base-change quadratic Hilbert modular form
Abstract: Let $\mathcal{F}$ be a quadratic Hilbert modular form which is the base-change of a classical new p-ordinary non-CM eigenform f. Associated to $\mathcal{F}$ there is a Galois representation called the Asai representation which is decomposable as a direct sum of two representations. Hence one obtains the corresponding factorisation of the complex L-function associated to the Asai representation. The p-adic (imprimitive) Asai L-functions for quadratic Hilbert modular eigenforms were defined by G. Grossi, D. Loeffler and S. Zerbes, so it makes sense to ask whether the complex factorisation has a p-adic analogue. This problem turns out to be quite non-trivial as the Asai L-function of a parallel-weight Hilbert modular form has no critical values. I will explain how to obtain a certain factorisation result adapting a method used by S. Dasgupta in a similar problem of factorising the p-adic L-function associated to the Rankin–Selberg self-convolution of a classical modular form. If time permits I will also discuss some arithmetic applications.

17.12.2025 .
Title:
Abstract:

07.01.2026 .
Title:
Abstract:

14.01.2026 Matthias Schütt (Hannover).
Title: Numerically and cohomologically trivial automorphisms of elliptic surfaces

Abstract: Numerically and cohomologically trivial automorphisms form a classical topic in algebraic geometry, especially for algebraic surfaces. I will focus on the case of complex elliptic surfaces of Kodaira dimension one, which features some surprising results, also with respect to past claims. Much of this will be motivated by the instructive case of Enriques surfaces.

21.01.2026 .
Title:
Abstract:

28.01.2026 Maria Ines Frutos Fernandez (Bonn)
Title: Formalizing the universal divided power algebra in Lean.
Abstract: Mathematical formalization is the process of digitizing mathematical definitions and results using a "proof assistant", a computer program capable of checking logical statements against a set of inference rules and some basic axioms. After a brief introduction to formalization, I will present a formalization in the proof assistant Lean of the universal divided power algebra. This is an analogue, in the theory of divided powers, of the classical algebra of polynomials. It is a crucial tool in the development of crystalline cohomology, and it is also used in p-adic Hodge theory to define the crystalline period ring.

Given an ideal I in a commutative ring R, a divided power structure on I is a collection of maps $\gamma_n : I \to I$ indexed by the natural numbers which behave like the family $x^n/n!$, but which can be defined even if division by factorials is not defined in R; the triple (R, I, γ_n) is called a divided power algebra. To any R-module, one can associate a universal divided power algebra.

While working on this formalization project, we uncovered an error in Roby's 1965 construction of the universal divided power algebra, which we repaired by providing an alternative proof inspired by the ideas in Roby's paper. The work discussed in this talk is joint with Antoine Chambert-Loir.

04.02.2026 .
Title:
Abstract: