Abstracts

Conference on the arithmetic of L-values

June 21-25, 2021 - University of Luxembourg

Fabrizio Andreatta: *On two mod p period maps: Ekedahl–Oort and fine Deligne–Lusztig stratifications*

Abstract: Consider a Shimura variety of Hodge type admitting a smooth integral model S at an odd prime $p \geq 5$. Consider its perfectoid cover $S^{\mathrm{ad}}(p^\infty)$ and the Hodge-Tate period map introduced by A. Caraiani and P. Scholze. I will explain, in the case of the Siegel variety, how compare the pull-back to $\mathcal{S}(p^\infty)^{\mathrm{ad}}$ of the Ekedahl-Oort stratification on the mod p special fiber of S and the pull back to $\mathcal{S}(p^\infty)^{\mathrm{ad}}$ of the fine Deligne-Lusztig stratification on the mod p special fiber of the flag variety which is the target of the Hodge-Tate period map. An application to the non-emptiness of Ekedhal-Oort strata is provided.

Joël Bellaïche: *Cohen-Macaulay modules and p-adic L-functions*

Abstract:

Denis Benois: *Critical p-adic L-functions and Iwasawa theory*

Abstract: We give an "étale" construction of Bellaïche's θ-critical p-adic L-function and discuss some questions of Iwasawa theory in that context. This is a joint work (in progress) with K. Büyükboduk.

Adel Betina: *Geometry of the eigencurve at CM points and exceptional zeros of Katz p-adic L-functions*

Abstract: The first part of this talk is based on a joint work with Mladen Dimitrov studying the geometry of the eigencurve at a p-stabilisation f of a weight one theta series θ_ψ irregular at p (i.e. the p-th Hecke polynomial of θ_ψ has a double root). We show that f belongs to exactly to three or four Hida families and study their mutual congruences at f. In particular, we show that the congruence ideal of one of the CM families has a simple zero at f if, and only if, a certain anti-cyclotomic L-invariant $\mathcal{L}(\psi/\psi^c)$ does not vanish. Combined with a divisibility proved by Hida–Tilouine, we deduce that the anti-cyclotomic Katz p-adic L-function $L_p^-(\psi/\psi^c, s)$ has a simple (trivial) zero at $s = 0$ if $\mathcal{L}(\psi/\psi^c) \neq 0$, which can be seen as an anti-cyclotomic analogue of a result of Ferrero and Greenberg.

The rest of the talk will focus on a current joint work with Ming-Lun Hsieh in which we give a formula for the derivative of p-adic L-functions for CM fields at exceptional zeros.

Andrea Conti: *Lifting trianguline Galois representations along isogenies*

Abstract: When interpolating p-adically Galois representations attached to automorphic forms, one obtains many new representations that are not de Rham locally at p. It is expected that such representations are characterized by the condition of being trianguline at p. We study how this notion behaves under functoriality: it is easy to show that if $S : \mathrm{GL}_m \to \mathrm{GL}_n$ is an algebraic representation and ρ is an m-dimensional trianguline Galois representation, the composition $S(\rho)$ is again trianguline. We prove that under reasonable assumptions the reverse implication is true, with the goal of applying the result to the study of congruence loci on eigenvarieties.

Fred Diamond: *Kodaira-Spencer isomorphisms and Hecke operators*

Abstract: Considering the normal bundle of the graph of the Hecke correspondence leads to a nice description of dualising sheaves on Iwahori-level Hilbert modular varieties. Combined with cohomological vanishing results (generalising work with Kassaei and Sasaki), this simplifies and strengthens prior constructions of Hecke operators (at p) on Hilbert modular forms over integral and torsion bases.

Giada Grossi: *Higher Hida theory for Hilbert modular varieties*

Abstract: In recent years Pilloni and his collaborators studied p-adic properties of the higher degree coherent cohomology of automorphic sheaves on certain (toroidal compactifications of) Shimura varieties. In this talk, I will explain how, motivated by applications to new constructions of p-adic L-functions, I recently developed higher Hida theory à la Pilloni for Hilbert modular varieties. More precisely, I will describe how to construct some modules interpolating p-adically higher coherent cohomology groups of the Hilbert modular variety associated to a totally real field F in the case where the prime p splits completely in F.

Adrian Iovita: *On a p-adic uniformisation of Abelian varieties with good reduction over local fields*

Abstract: Together with Jackson Morrow and Alexandru Zaharescu, while investigating Fontaine's p-adic integration on Abelian varieties over local fields, we realized that the p-adic points of the Abelian variety, satisfying certain conditions, have a type of p-adic uniformization which we have not encountered before. I will discuss various aspects of this phenomenon.

Mahesh Kakde: *On Brumer-Stark units*

Abstract: In this talk I will report on my joint work with Samit Dasgupta on the Brumer-Stark conjecture as well as explicit formulae for the Brumer-Stark units.

Alexandre Maksoud: *Main conjectures and extra zero conjectures for Artin motives*

Abstract: We will state a precise conjecture describing a generator of the Greenberg-style Selmer group attached to an Artin motive that is unramified at an odd prime p. This conjecture involves a new $\mathcal{L}$-invariant and generalizes various classical conjectures in Iwasawa theory. In particular, in the case of a monomial representation it is essentially equivalent to some Iwasawa-theoretic conjectures for Rubin-Stark elements recentlyformulated by Burns, Kurihara and Sano. If time permits we also describe some applications to the Gross-Kuz'min conjecture.

Jan Nekovář: *Plectic polylogarithm and special values of L-functions*

Abstract:

Sheng-Chi Shih: *Eisenstein intersection points on the Hilbert Eigenvariety*

Abstract: In this talk, we will report a joint work with M. Dimitrov and A. Betina in which we study the local geometry of the Hilbert Eigenvariety at an intersection point between an Eisenstein component and the cuspidal locus. As application, we show the non-vanishing of certain Katz p-adic L-functions at $s = 0$.

Yichao Tian: *Arithmetic level raising of even unitary groups*

Abstract: In my joint work with Yifeng Liu, Liang Xiao, Wei Zhang and Xinwen Zhu on the Beilinson—Bloch—Kato conjecture for Rankin—Selberg motives, a key role was played by a result on the level raising of automorphic forms on unitary groups of even rank. In this talk, I will explain such a result in detail and related questions. The proof uses intersection theory of special cycles on unitary Shimura varieties, as well as the deformation problem of some conjugate self-dual Galois representations over a CM field.