International conference on the

Arithmetic of L-functions

22 – 26 May 2023

Instituto De Ciencias Matemáticas (ICMAT), Madrid

Arithmetic of L-functions

– Conference booklet –

Contents

Introduction 3

Campus map 4

Practical information 5

Schedule overview 6

Schedule 7

Plenary lectures 9

Short talks by early-career researchers 14

Poster presentations 16

List of participants 17

Last updated: Saturday 3rd June, 2023, at 11:45.

Introduction

The study of the arithmetic properties of special values of zeta functions and, more generally, of L-functions, is a central theme in modern Number Theory that has a long tradition stretching back to Dirichlet and Kummer in the nineteenth century.
In the second half of the twentieth century, the subject was revolutionised by the formulation and study of Main Conjectures in Iwasawa theory, of the Birch and Swinnerton-Dyer Conjecture, and of the 'Tamagawa Number Conjecture' of Bloch and Kato. Through such conjectures and related results, the properties of L-functions informed the development of Arithmetic Algebraic Geometry.
The aim of this conference is to discuss recent significant developments in this area.

In addition to research talks by accomplished researchers in the field, there will be short talks by early-career researchers and a poster session.

Dominik Bullach
Daniel Macías Castillo
(Organisers)

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EPSRC CENTRE FOR DOCTORAL TRAINING IN GEOMETRY AND NUMBER THEORY
LSGNT London School of Geometry & Number Theory

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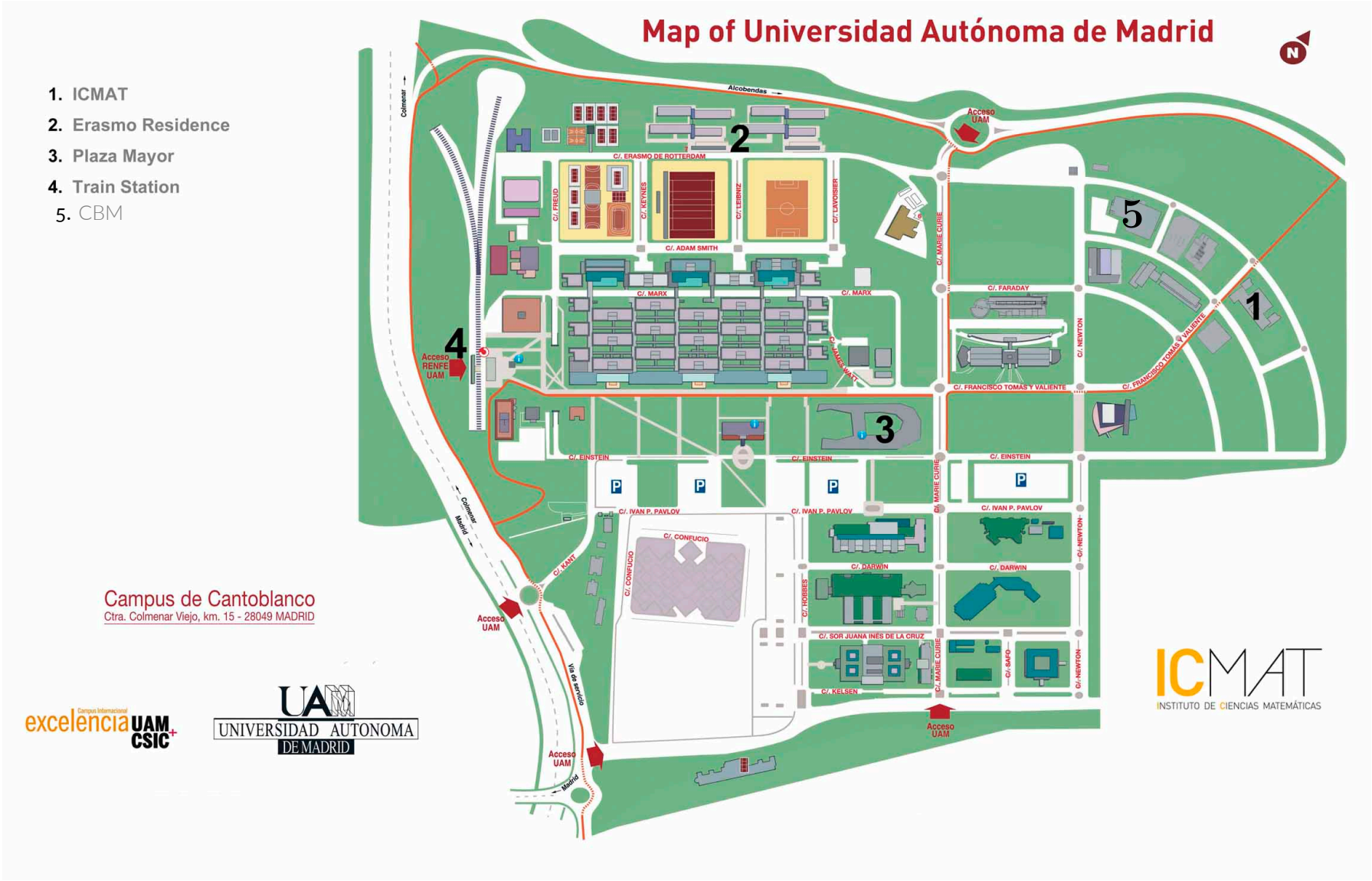
EXCELENCIA SEVERO OCHOA
Dic. 2011-2023

KING'S College LONDON

FOUNDATION COMPOSITIO MATHEMATICA

All talks are taking place at ICMAT, in the 'Sala Azul'.



Practical information

How to arrive

Train The nearest train station is **Cantoblanco Universidad** (marked as 4 on the campus map), which is served by the **Cercanías train line C4** (both Alcobendas direction and Colmenar Viejo direction; see here for more information).
Due to construction works there are however no direct trains to, or from, central Madrid at the moment. Instead you will have to **change trains at Chamartín station**.
For example, if you are travelling from Atocha train station, then take a north-bound train on line C1, C2, C7, or C10, stop at Charmartín, and change to line C4 there. Similarly, to head back to central Madrid, you should stop at Chamartín and change to a south-bound train on one of the other lines.

Once you have arrived at Cantoblanco Universidad, walk straight ahead on calle Francisco Tomás y Valiente. The ICMAT is at the very end of this street, just on the intersection with 13-15 Nicolás Cabrera. You should account for a 15 minute walk.

Bus Information on how to arrive by bus can be found here.

Lunch places

The cafeteria closest to ICMAT is located in the Centro Biología Molecular, which is the building marked 5 on the map and on the same street as ICMAT.

Alternatively, there is a cafeteria in Plaza Mayor (marked as 3 on the campus map).

In addition, each of the faculties of the university also have their own cafeteria (for more information see here).

Spaces to work

ICMAT offers various working spaces such as the 'Sala Jae' on the first floor, which has plenty of desks available to use. It is located to the left of the lifts on the first floor, behind a set of grey doors.
For discussions, you can use the 'Sala de trabajo Noether' (room B8) on the ground floor or the 'Sala de trabajo Gauss' (room 110) on the first floor.

In addition, the basement houses a library that is open whenever staffed.

Schedule overview

Monday		Tuesday		Wednesday		Thursday		Friday	
10:00 – 10:30	Registration	10:00 – 11:00	**Bley**	10:00 – 11:00	**Dokchitser**	10:00 – 11:00	**Kurihara**	10:00 – 10:20	Galanakis
10:30 – 11:30	**Kobayashi**	11:00 – 11:30	Coffee	11:00 – 11:30	Coffee/Posters	11:00 – 11:30	Coffee	10:30 – 11:30	**Kakde**
11:30 – 12:00	Coffee	11:30 – 12:30	**Venjakob**	11:30 – 12:30	**Wuthrich**	11:30 – 12:30	**Büyükboduk**	11:30 – 12:00	Coffee
12:00 – 13:00	**Burungale**	12:40 – 13:40	**Greither**	12:40 – 13:40	**Vigni**	12:40 – 13:40	**Sano**	12:00 – 13:00	**Popescu**
13:10 – 13:30	Zerman	13:40 – 15:00	Lunch	13:40 – 15:00	Lunch	13:40 – 15:00	Lunch	**Conference end**	
13:30 – 14:50	Lunch	15:00 – 16:00	**Nickel**	15:00 – 15:20	Işik	15:00 – 16:00	**Burns**		
14:50 – 15:50	**Pozzi**	16:10 – 16:30	Forrás	15:30 – 15:50	Mehrabdollahei	16:10 – 17:10	**Seo**		
16:00 – 17:00	**Rotger**					20:00 – ??	Dinner		
17:10 – 17:30	Huang								

= Plenary lecture, = Online lecture, = Short talk.

Schedule

All talks take place in the 'Sala Azul'.

Monday, 22 May

10:00 – 10:30	Registration
10:30 – 11:30	**Shinichi Kobayashi** Anticyclotomic CM Iwasawa theory at inert primes I → p. 9
11:30 – 12:00	Coffee break
12:00 – 13:00	**Ashay A. Burungale** Anticyclotomic CM Iwasawa theory at inert primes II → p. 9
13:10 – 13:30	**Francesco Zerman** Kolyvagin systems for the big Galois representation attached to a quaternionic Hida family of modular forms → p. 15
13:30 – 14:50	Lunch break
14:50 – 15:50	**Alice Pozzi** Tame triple product periods → p. 12
16:00 – 17:00	**Víctor Rotger** Elliptic Stark Conjectures → p. 12
17:10 – 17:30	**Ting-Han Huang** Special values of triple product p-adic L-functions associated with finite slope families and p-adic Abel–Jacobi maps → p. 14

Tuesday, 23 May

10:00 – 11:00	**Werner Bley** The equivariant local epsilon constant conjecture for unramified twists of $\mathbb{Z}_p^r(1)$ → p. 9
11:00 – 11:30	Coffee break
11:30 – 12:30	**Otmar Venjakob** ϵ-isomorphisms for rank-one modules over Lubin–Tate Robba rings → p. 13
12:40 – 13:40	**Cornelius Greither** On the Galois module structure of minus class groups in CM-extensions → p. 10
13:40 – 15:00	Lunch break
15:00 – 16:00	**Andreas Nickel** A new main conjecture in non-commutative Iwasawa theory → p. 11
16.10 – 16:30	**Bence Forrás** Integrality of smoothed p-adic Artin L-functions → p. 14

Wednesday, 24 May

10:00 – 11:00	**Vladimir Dokchitser** Motivic pieces of curves → p. 10
11:00 – 11:30	Coffee break and **poster session** (→ p. 16): Antonio Cauchi Donghyeok Lim Kazuaki Murakami
11:30 – 12:30	**Christian Wuthrich** Mordell–Weil groups as Galois modules → p. 13
12:40 – 13:40	**Stefano Vigni** On the p-part of the Tamagawa number conjecture for motives of modular forms → p. 13
13:40 – 15:00	Lunch
15:00 – 15:20	**Erman Işik** On anticyclotomic Iwasawa theory of Hecke characters for ordinary primes → p. 14
15:30 – 15:50	**Mahya Mehrabdollahei** Mahler measure and special values of L-functions → p. 15

Thursday, 25 May

10:00 – 11:00	**Masato Kurihara** Euler and Kolyvagin systems of Gauss sum type → p. 11
11:00 – 11:30	Coffee break
11:30 – 12:30	**Kâzım Büyükboduk** Arithmetic of critical p-adic L-functions → p. 9
12:40 – 13:40	**Takamichi Sano** Derived Bockstein maps and anticyclotomic p-adic Birch and Swinnerton-Dyer conjectures → p. 12
13:40 – 15:00	Lunch break
15:00 – 16:00	**David Burns** → p. 9 On symmetric Euler systems
16:10 – 17:10	**Soogil Seo** On a conjecture of Coleman concerning circular distributions → p. 13
20:00 – ??	Conference dinner **Asador Zeraín**, Calle Quevedo 3, 28014 Madrid

Friday, 26 May

10:00 – 10:20	**Alexandros Galanakis** Adelic Eisenstein classes and abelian Stickelberger elements of totally real fields → p. 14
10:30 – 11:30	**Mahesh Kakde** (online) Ribet's method → p. 11
11:30 – 12:00	Coffee break
12:00 – 13:00	**Cristian D. Popescu** An Equivariant Tamagawa Number Formula for Abelian t–modules → p. 11
	End of conference

Plenary lectures

The equivariant local epsilon constant conjecture for unramified twists of $\mathbb{Z}_p^r(1)$

Werner Bley
Ludwig-Maximilians-Universität München

Tuesday
10 – 11

Abstract We discuss results on the equivariant local epsilon constant conjecture for p-adic representations $T = \mathbb{Z}_p^r(1)(\rho^{\mathrm{nr}})$ where $\rho^{\mathrm{nr}}\colon G_K \to \mathrm{Gl}_r(\mathbb{Z}_p)$ is an r-dimensional unramified representation of the absolute Galois group G_K. For example, if A is an abelian variety of dimension r defined over $\mathbb{Q}_p$ with good ordinary reduction, then the Tate module $T = T_p\widehat{A}$ associated to the formal group $\widehat{A}$ of A is a p-adic representation of this form.
This is a report on joint work with Alessandro Cobbe.

On symmetric Euler systems

David Burns
King's College London

Thursday
3 – 4

Abstract In the 1980's Robert Coleman investigated the possibility of a global analogue of the theory of Coleman power series. Motivated by his ideas in this direction, we present a conjecture concerning the algebraic properties of Euler systems (of arbitrary rank) for $\mathbb{G}_m$. This conjecture is elementary to state and yet strictly finer than the corresponding equivariant Tamagawa number conjecture (and key ideas also translate to more general settings). We discuss a concrete strategy to prove the conjecture and also some of the striking consequences that follow from this approach to the study of special value conjectures. This is joint work with Dominik Bullach, Alex Daoud and Soogil Seo.

Anticyclotomic CM Iwasawa theory at inert primes I, II

Ashay A. Burungale and Shinichi Kobayashi
University of Texas at Austin and Kyushu University

Monday
10.30 – 11.30, 12 – 1

Abstract The talks plan to describe aspects of Iwasawa theory of a CM elliptic curve E defined over $\mathbb{Q}$ along the anticyclotomic $\mathbb{Z}_p$-tower of the CM field for p inert. It was envisaged by Rubin in the mid 80's. The first talk will explain the background of the theory and its consequences such as a Bertolini–Darmon–Prasanna type formula and Kato's epsilon conjecture. The second talk will present an asymptotic formula for the p-adic valuation of the central L-values of E along the anticyclotomic $\mathbb{Z}_p$-tower. The key is determination of the p-adic valuation of local resolvents in $\mathbb{Z}_p$-extensions.
(Based on joint works with K. Ota, and partly with S. Yasuda.)

Arithmetic of critical p-adic L-functions

Kâzım Büyükboduk
University College Dublin

Thursday
11.30 – 12.30

Abstract In joint work with Denis Benois, we give an étale construction of Bellaïche's p-adic L-functions about θ-critical points on the Coleman–Mazur eigencurve. I will discuss applications of this construction towards leading term formulae in terms of p-adic regulators on what we call the thick Selmer groups, which come attached to the infinitesimal deformation at the said θ-critical point along the eigencurve, and a Λ-adic $\mathcal{L}$-invariant. Besides our interpolation of the Beilinson–Kato elements about this point, the key input to prove the interpolative properties of this p-adic L-function is a new p-adic Hodge-theoretic "eigenspace-transition via differentiation" principle.

Motivic pieces of curves

Vladimir Dokchitser
University College London

Wednesday
10 – 11

Abstract A curve that admits a finite group of automorphisms can be decomposed into "motivic pieces", which correspond to the irreducible representations of the group. I will discuss their L-functions and an analogue of the Birch–Swinnerton-Dyer conjecture, and mention some new methods we have for studying them. As an application, I will sketch a new proof of the parity conjecture for elliptic curves that makes use of the arithmetic of genus 3 curves with automorphisms. This is joint work with Holly Green, Alexandros Konstantinou and Adam Morgan.

On the Galois module structure of minus class groups in CM-extensions

Cornelius Greither
Universität der Bundeswehr München

Tuesday
12.40 – 1.40

Abstract We report on joint work with T. Kataoka. The primary object of interest is C, the minus part of the class group of a CM field L which is an abelian G-Galois extension of a totally real field K. (In fact we need the so-called T-modification; more on this in the talk). It has been known for a while that the Fitting ideal of C over the appropriate ring R (the minus part of $\mathbb{Z}[G]$) can be described via an equivariant L-value in conjunction with algebraic data arising from the ramification and the Frobenius maps of L/K.

In a recent publication, Kataoka and myself sharpened this as follows. There is an equivalence relation on finite R-modules such that C is equivalent to a certain module $\omega^1(A)$ which is totally explicit and depends only on ramification and Frobenius data for L/K. The equivalence relation is weaker than being isomorphic but stronger than "having the same Fitting ideal up to a principal factor". In ongoing work we singled out a class of finite R-modules that we call admissible. Every class group C occurring in nature is an admissible module, and at least in some situations we can prove the converse (realizability). It appears that if G is not very small, the class of admissible modules is a very thin subclass of the category of all finite R-modules. It forms a submonoid under taking direct sums, and we try to describe this submonoid as precisely as possible. In doing this we encounter unexpected group-theoretical problems.

We also intend to mention concrete consequences concerning class groups that follow from our results on equivalence and admissibility. The resulting predictions on class numbers were confirmed numerically in some cases, as a test of the theory.

Ribet's method

Mahesh Kakde (online)
Indian Institute of Science, Bangalore

Friday
10.30 – 11.30

Abstract We will discuss Ribet's method for construction of extension classes and our generalisation of it in the "residually indistinguishable" case. This is a joint work with Samit Dasgupta, Jesse Silliman and Jiuya Wang.

Euler and Kolyvagin systems of Gauss sum type

Masato Kurihara
Keio University

Thursday
10 – 11

Abstract I will discuss mainly the elliptic curve case. The Euler and Kolyvagin systems of Gauss sum type in this case have information on the structure of the classical Selmer groups, while Kato's Euler system has information on some cohomology groups. I will talk about some conjectures and the recent progress in this theory, especially by R. Sakamoto and Chan-Ho Kim.

A new main conjecture in non-commutative Iwasawa theory

Andreas Nickel
Universität der Bundeswehr München

Tuesday
3 – 4

Abstract We formulate a new equivariant main conjecture in the Iwasawa theory of number fields and study its properties. More precisely, we do this for arbitrary one-dimensional p-adic Lie extensions of an arbitrary number field K. So we do not require the extension to be abelian or K to be totally real. We discuss its relation to existing conjectures and deduce its validity in several interesting cases. This is joint work with Antonio Mejías Gil.

An Equivariant Tamagawa Number Formula for Abelian t–modules

Cristian D. Popescu
University of California, San Diego

Friday
12 – 1

Abstract To an abelian t–module $\mathcal{E}$ defined over the base field F of an abelian extension K/F of characteristic p global fields, one can associate a motivic $G(K/F)$–equivariant, Goss–type L–function $\Theta^{\mathcal{E}}_{K/F}$, defined on a space of mixed characteristic $(p,0)$ and taking values in characteristic p. A Tamagawa Number Formula for the value $\Theta^{\mathcal{E}}_{K/F}(0)$ was proved by Taelman in 2012, in the case where $G(K/F)$ is trivial and $\mathcal{E}$ is a Drinfeld module (i.e. a t–module of dimension 1.) This result was

generalized by Anglés–Taelman and by Fang to the case where $p \nmid |G(K/F)|$ and $\mathcal{E}$ is a Drinfeld module, respectively an arbitrary abelian t–module. In 2020, in joint work with Ferrara, Green and Higgins, we proved a $G(K/F)$–Equivariant Tamagawa Number Formula (ETNF) for arbitrary Galois groups $G(K/F)$ and Drinfeld modules $\mathcal{E}$. In 2021, in joint work with Green, we extended this result to arbitrary abelian t–modules $\mathcal{E}$. In this lecture we will discuss the formulation of, and some proof techniques for, the ETNF for t–modules, as well as some of its applications, including proofs of t–module analogues of the classical strong Brumer–Stark and Coates–Sinnott conjectures.

Tame triple product periods

Alice Pozzi
Imperial College London/University of Bristol

Monday
2.50 – 3.50

Abstract Tame triple product periods are images of a product of two weight 1 eigenforms in the generalised eigenspace attached to a mod p eigenform of weight 2. They can be viewed as mod p analogues of complex triple product periods, which are related to L-values by the work of Harris–Kudla. In this talk, I will present a conjecture relating these tame triple product periods to a regulator of global points of elliptic curves in rank 2. This conjecture can be interpreted as an elliptic counterpart of a conjecture of Harris–Venkatesh on derived Hecke operators for weight 1 forms.
This is joint work with Henri Darmon.

Elliptic Stark conjectures

Víctor Rotger
Universitat Politècnica de Catalunya

Monday
4 – 5

Abstract In this lecture I will discuss several variants of a conjecture of Darmon, Lauder and myself. Given a triple (f, g, h) of modular forms of weights $(2, 1, 1)$, the conjecture formulates a p-adic BSD-type relationship between an analytic iterated integral and a regulator given by logarithms of global points. I will focus on the particularly intriguing case where the weight one form g gives rise to a point on the eigencurve that fails to be étale over weight space.

Derived Bockstein maps and anticyclotomic p-adic Birch and Swinnerton-Dyer conjectures

Takamichi Sano
Osaka Metropolitan University

Thursday
12.40 – 1.40

Abstract We develop the theory of "derived Bockstein maps". We establish a general descent formalism involving derived Bockstein maps. As an application of our formalism, we show that a conjecture of Birch and Swinnerton-Dyer type for Heegner points formulated by Bertolini and Darmon in 1996 follows from an Iwasawa main conjecture up to a p-adic unit. We also show an analogous result on a p-adic Birch and Swinnerton-Dyer conjecture for the Bertolini–Darmon–Prasanna p-adic L-function recently formulated by Agboola and Castella.

On a conjecture of Coleman concerning circular distributions

Soogil Seo
Yonsei University

Thursday
4.10 – 5.10

Abstract We introduce a conjecture of Robert Coleman concerning the theory of circular distributions and then discuss its proof. This is joint work with Dominik Bullach, David Burns and Alex Daoud.

ϵ-isomorphisms for rank-one modules over Lubin–Tate Robba rings

Otmar Venjakob
Ruprecht-Karls-Universität Heidelberg

Tuesday
11.30 – 12.30

Abstract Inspired by Nakamura's work on ϵ-isomorphisms for (φ, Γ)-modules over (relative) Robba rings with respect to the cyclotomic theory we formulate an analogous conjecture for L-analytic Lubin–Tate (φ_L, Γ_L)-modules over (relative) Robba rings for any finite extension L of $\mathbb{Q}_p$. In contrast to Kato's and Nakamura's setting, our conjecture involves L-analytic cohomology instead of continuous cohomology within the generalized Herr complex. Similarly, we restrict to the identity components of D_{cris} and D_{dR}, respectively. For rank one modules of the above type or slightly more general for trianguline ones, we construct ϵ-isomorphisms for their Lubin–Tate deformations satisfying the desired interpolation property.
This is joint work with Milan Malcic, Rustam Steingart and Max Witzelsperger.

On the p-part of the Tamagawa number conjecture for motives of modular forms

Stefano Vigni
Università degli Studi di Genova

Wednesday
12.40 – 1.40

Abstract The Tamagawa number conjecture of Bloch–Kato and Fontaine–Perrin-Riou predicts formulas for special values of L-functions of motives and can be seen as a vast generalization of the Birch–Swinnerton-Dyer conjecture for abelian varieties. In this talk, I will sketch a proof (under suitable arithmetic assumptions) of several cases of the p-part of the Tamagawa number conjecture for motives of modular forms of higher (even) weight in analytic rank 1.
This is joint work with Matteo Longo.

Mordell–Weil groups as Galois modules

Christian Wuthrich
University of Nottingham

Wednesday
11.30 – 12.30

Abstract Let E be an elliptic curve over a number field k and let K/k be a finite Galois extension with group G, typically cyclic or dihedral. Let p be an odd prime dividing the degree $[K : k]$. I wish to present results on how to determine the p-adic completion of $E(K)$ as a $\mathbb{Z}_p[G]$-module using, if possible, only local information and information of E over k. I will also address the case when k is a p-adic field.

Short talks
by early-career researchers

Integrality of smoothed p-adic Artin L-functions

Bence Forrás
Universität Duisburg-Essen

Tuesday
4.10 – 4.30

Abstract We introduce a smoothed version of the equivariant S-truncated p-adic Artin L-function for a one-dimensional admissible p-adic Lie extension of number fields with Galois group $\mathcal{G}$. This is a unit in the centre of the ring of quotients $\mathcal{Q}(\mathcal{G})$ of the Iwasawa algebra. By integrality of this element we mean that it comes from some subring of $\mathcal{Q}(\mathcal{G})$ via the natural map; this goes back to a conjecture of Greenberg. We discuss certain cases in which this has been verified.

Adelic Eisenstein classes and abelian Stickelberger elements of totally real fields

Alexandros Galanakis
Universität Bielefeld

Friday
10 – 10.20

Abstract We will discuss the construction of an adelic variant of the Eisenstein class, building on the conceptual approach of Beilinson, Kings and Levin. The goal is to prove results regarding abelian Stickelberger elements of totally real fields, stronger than the ones proven previously by Dasgupta and Spieß. This is a joint work in progress with Michael Spieß.

Special values of triple product p-adic L-functions associated with finite slope families and p-adic Abel–Jacobi maps

Ting-Han Huang
Concordia University

Monday
5.10 – 5.30

Abstract In this work, I prove a p-adic Gross–Zagier formula which relates the special value of the triple product p-adic L-function associated with finite slope families at a balanced classical weight, to the p-adic Abel–Jacobi image of the generalized diagonal in the product of three Kuga–Sato varieties, evaluated at a certain differential form. This generalizes the result of H. Darmon and V. Rotger for Hida families.

On anticyclotomic Iwasawa theory of Hecke characters for ordinary primes

Erman Işik
University College Dublin

Wednesday
3 – 3.20

Abstract In this talk, I will report the result where we prove the p-ordinary Iwasawa's main conjecture for Hecke characters over a CM field, which is a generalization of Büyükboduk's result, via the conjectural Rubin–Stark elements assuming Hida and Tilouine's Σ–Leopoldt conjecture. This result has an application towards the study of the Mordell–Weil ranks of the CM abelian varieties.
We then explore a consequence towards the anticyclotomic Iwasawa main conjecture for CM Hilbert modular forms (as a generalization of the main results of Agboola–Howard and T. Arnold on CM elliptic curves and self-dual CM modular forms).

Mahler measure and special values of L-functions

Mahya Mehrabdollahei
Universität Göttingen

Wednesday
3.30 – 3.50

Abstract The Mahler measure is a type of height function for polynomials. For a polynomial P, the Mahler measure is defined as the arithmetic mean of $\log|P|$ on the torus. In general, for multivariate polynomials, there is no closed formula to compute this value also is not always possible to have an error control approximation of it. However, such a computation is interesting since, for some polynomials, the Mahler measure is related to special values of the Dirichlet L-functions. In this talk, we will see an infinite sequence of multivariate polynomials for which we have not only computed the Mahler measure but also the limit of the sequence which is linked to the Apery constant. Moreover, the Mahler measure of each member of this sequence can be written as a linear combination of Dirichlet L-functions associated with odd primitive characters. Finally, we explain that this family provides an infinite number of solutions to the Chinburg conjecture.

Kolyvagin systems for the big Galois representation attached to a quaternionic Hida family of modular forms

Francesco Zerman
Università degli Studi di Genova

Monday
1.10 – 1.30

Abstract Thanks to work of Büyükboduk, we know how to build a Kolyvagin system (in the sense of Mazur-Rubin) for the big Galois representation T attached to a Hida family of modular forms. This Kolyvagin system is built out of the so-called 'big Heegner points' of Howard and lives in the cohomology of T over an imaginary quadratic field K satisfying the usual Heegner hypothesis with respect to the tame conductor N of the Hida family. The aim of my talk is to show that one can build a Kolyvagin system for T when K satisfies only a weaker, generalized Heegner hypothesis. This is performed by applying Kolyvagin's descent to the 'quaternionic Big Heegner points' of Longo–Vigni, who extended Howard's construction to the broader context of Shimura curves. Straightforward consequences of this construction are a proof of one divisibility in the Iwasawa main conjecture for T over K and a bound for the rank of the Selmer group of T over K

Poster presentations

Towards new Euler systems for automorphic Galois representations

Antonio Cauchi
Concordia University

Wednesday
11 – 11.30

Abstract The construction of Euler systems for Galois representations associated to automorphic forms often relies on the existence of Rankin-Selberg integrals which calculate the corresponding L-function. I will report on a new Rankin-Selberg integral, which represents a twist of the degree 5 L-function of cusp forms on GSp(4), and its application to the study of the arithmetic of the standard Galois representation associated to cusp forms on GSp(4). I will also explain how this generalizes to other similar settings. This is joint work with Armando Gutierrez.

The finitude of tamely ramified pro-p extensions of number fields with cyclic p-class groups

Donghyeok Lim
Ewha Womans University

Wednesday
11 – 11.30

Abstract Let p be an odd prime and F be a number field whose p-class group is cyclic. Let $F_{\{\mathfrak{q}\}}$ be the maximal pro-p extension of F which is unramified outside a single prime ideal $\mathfrak{q}$ of F prime to p. In this work, we study the finitude of the Galois group $G_{\{\mathfrak{q}\}}(F)$ of $F_{\{\mathfrak{q}\}}$ over F. We prove that $G_{\{\mathfrak{q}\}}(F)$ is finite for the majority of $\mathfrak{q}$'s such that the generator rank of $G_{\{\mathfrak{q}\}}(F)$ is two, provided that for $p = 3$, F is not a complex quartic field containing the primitive third root of unity.
This is joint work with Yoonjin Lee (Ewha Womans University).

Kida's formula for split prime $\mathbb{Z}_p$-extensions over imaginary quadratic fields

Kazuaki Murakami
Toho University

Wednesday
11 – 11.30

Abstract Let p be an odd prime number and k an imaginary quadratic field in which p splits into $\mathfrak{p}$ and $\mathfrak{p}^*$. Then there exists a uniquely defined $\mathbb{Z}_p$-extension N_∞/k such that the prime ideal $\mathfrak{p}^*$ does not ramify in N_∞. For a finite extension K/k, we call $K_\infty = KN_\infty$ the 'split prime $\mathbb{Z}_p$-extension'. We state an analogue of Kida's formula for the split prime $\mathbb{Z}_p$-extension and apply the formula to the isomorphism classes of Iwasawa modules and Greenberg's generalized conjecture (GGC).

List of participants

Alberto Angurel Andrés	(University of Nottingham)
Fouad Aoulad Omar	(Abdelmalek Essaadi University)
Francesc Bars	(Universitat Autonoma de Barcelona)
James Bell	(University College London)
Kaan Bilgin	(University of Amsterdam)
Matthew Bisatt	(University of Bristol)
Werner Bley	(Ludwig-Maximilians-Universität München)
Soufiane Boumasmoud	(Cadi Ayyad University)
Oliver Braunling	(University of Wuppertal)
Dominik Bullach	(King's College London)
Jose Ignacio Burgos Gil	(ICMAT)
David Burns	(King's College London)
Ashay Burungale	(University of Texas at Austin)
Kazim Buyukboduk	(University College Dublin)
Bilson Castro	(ICMAT-UAM)
Antonio Cauchi	(Concordia University)
Pedro José Cazorla García	(University of Manchester)
Fernando Chamizo	(UAM and ICMAT)
Diego Chicharro	(King's College London)
Lilybelle Cowland Kellock	(University College London)
Pranendu Darbar	(The Norwegian University of Science and Technology)
Mihir Deo	(University of Ottawa)
Paola Diago	(Universidad Complutense de Madrid)
Vladimir Dokchitser	(University College London)
Ben Forrás	(Universität Duisburg-Essen)
Alexandros Galanakis	(University of Bielefeld)
Guillermo Gamarra Segovia	(Duisburg-Essen University)
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