32nd Automorphic Forms Workshop
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ABSTRACTS

Nick Andersen (University of California, Los Angeles) `nandersen@math.ucla.edu`

Markov spectra for modular billiards

ABSTRACT: We introduce some analogues of the Markov spectrum defined in terms of modular billiards and consider the problem of characterizing that part of the spectrum below the lowest limit point. This is joint work with Bill Duke.

Victor Manel Aricheta (Emory University) `victor.manuel.aricheta@emory.edu`

Supersingular Elliptic Curves and Sporadic Groups

ABSTRACT: We extend Ogg's analysis of j-invariants of supersingular elliptic curves to elliptic curves with level structure. In particular, we provide liftings of *generalized supersingular polynomials*—polynomials over finite fields whose roots correspond to supersingular elliptic curves with level structure—to polynomials over $\mathbb{Q}$; these polynomials over $\mathbb{Q}$ come from modular functions. Furthermore, we determine when these generalized supersingular polynomials split completely. This analysis yields geometric characterizations for the prime spectra of certain sporadic simple groups (e.g. baby monster, Fischer, Conway, etc.), which is an extension of Ogg's geometric characterization of the primes dividing the order of the monster group. Finally, we present evidence for a role of supersingular elliptic curves in umbral moonshine.

Allison Arnold-Roksandich (Oregon State University) `arnoldra@oregonstate.edu`

Creating Several Infinite Classes of Quantum Modular Forms

ABSTRACT: In 2013, Lemke Oliver created a list of all eta-quotients which are theta functions. In 2016, Folsom, Garthwaite, Kang, Swisher and Treneer utilized this list of "eta-theta" functions along with Zwegers's construction of mock theta functions to create a set of mock modular forms which are also quantum modular forms. Later in 2016, Diaz, Ellefsen and Swisher generalized a subset of these mock modular forms to a single general form which included the every element of this subset. This talk will discuss the work done to extend this generalization to a larger general form which includes all functions made by Folsom et al.

Siegfred Baluyot (University of Illinois at Urbana-Champaign) sbaluyot@illinois.edu

On the density of zeros of the Riemann zeta-function near the critical line

ABSTRACT: In 1989, Conrey invented a technique of using Kloosterman sum estimates to show that the Riemann zeta-function has many zeros on the critical line. He claimed that his method also gives a new estimate for the density of zeros near the critical line, but did not publish a proof. In this talk, we will present Conrey's technique and show how to modify it to prove his claim and deduce this new zero-density estimate. The main result is an asymptotic formula for a mollified moment of zeta along a vertical line to the right of the critical line.

Paul Beirne (University College Dublin) paul.beirne@ucdconnect.ie

Knot invariants and modular forms

ABSTRACT: In 2006, Dasbach and Lin observed stability in the coefficients of the Nth colored Jones polynomial for alternating knots. This observation and its consequences have sparked a flurry of activity in both number theory and quantum topology. For example, Garoufalidis, Le and Zagier conjectured identities which have a striking resemblance to those occurring in the classical setting of Rogers and Ramanujan. In this talk, we discuss these developments and the construction of a new infinite family of quantum knot invariants which are related to modular forms.

Lea Beneish (Emory University) lea.beneish@emory.edu

Weight two moonshine

ABSTRACT: This research has two main objectives: one is to investigate higher weight moonshine, and the other is to put umbral moonshine in a context closer to monstrous moonshine. We take Mathieu moonshine as a starting point, giving a construction which associates weakly holomorphic modular forms of weight 2 to elements of M_{23}. We prove the existence of a corresponding graded M_{23}-module.

Stefan Bleß (RWTH Aachen) stefan.bless@matha.rwth-aachen.de

The Maass-Space and ultraspherical differential operators

ABSTRACT: The Maass-Space is a vector space of modular forms with some special relation to their fourier-coefficients. Andrianov proved the invariance of this space under hecke-operators by computing the fourier-coefficients, but nowadays there is some easier way to prove this. The image of the ultraspherical differential operator is also able to characterize a Maass-form and the relevant hecke-operaters to the image of the differential operator and the Maass-Space are commutative.

Jim Brown (Clemson University) `jimlb@g.clemson.edu`

Congruences for paramodular Saito-Kurokawa lifts and applications

ABSTRACT: Let $\phi \in S_k(\Gamma_0(M))$ be a newform whose functional equation has sign -1. It is well known there is a lift of ϕ to a Siegel modular form $f_\phi \in S_k(\Gamma[M])$ where $\Gamma[M] \subset \mathrm{Sp}_4(\mathbf{Q})$ is the paramodular group. In this talk we specialize the congruence result described in Huixi Li's talk to the case the Siegel modular form is f_ϕ. We show there is a congruence between f_ϕ and a cuspidal Siegel eigenform with irreducible Galois representation. This congruence provides evidence for the Bloch-Kato conjecture for ϕ not covered by previous work. This is joint work with Huixi Li.

Dohoon Choi (Korea University) `dohoon.choi@gmail.com`

Ramanujan congruences for weakly homolophic modular forms

ABSTRACT: In this talk, I will discuss on special congruences concerning with weakly holomorphic modular forms, which are motivated from congruences for the partition function studied by Ramanujan.

Kwangho Choiy (Southern Illinois University) `kchoiy@siu.edu`

Tempered spectrum and multiplicity for unitary principal series of p-adic Spin groups

ABSTRACT: In the context of the Langlands correspondence, studying non-discrete tempered spectra, we construct tempered L-packets from discrete series of Levi subgroups. This talk will focus on the case of unitary principal series of $Spin(n)$ over a p-adic field, and address non-discrete tempered spectra and multiplicities in restriction by means of R-groups. We shall also discuss what are expectations and obstacles for arbitrary Levi subgroups of $Spin(n)$. This is joint work with D. Ban and D. Goldberg.

Andrea Conti (Universität Heidelberg) `contiand@gmail.com`

Trianguline Galois representations and Schur functors

ABSTRACT: Given a unitary group G over a totally real field, split at the p-adic places and compact at infinity, the Galois representations attached to p-adic overconvergent automorphic forms for G are known to be trianguline at p in the sense of (φ, Γ)-modules or B-pairs. It is conjectured that this condition characterizes all such representations. We show that a p-adic Galois representation is trianguline at p if and only it is trianguline after composition with a Schur functor. We give an application of this result to the study of the Galois image at points of the eigenvariety for G.

Rachel Davis (University of Wisconsin, Madison) `rachel.davis@wisc.edu`

Congruence and noncongruence subgroups arising from G-structures

ABSTRACT: Congruence modular forms are more understood than noncongruence forms, although Atkin and Swinnerton-Dyer and Scholl developed the study of congruence relations for noncongruence modular forms. Chen showed that all finite index subgroups of $\mathrm{SL}_2(\mathbb{Z})$ can be viewed in terms of elliptic curves with a G-structure, for some finite 2-generated group G and gave a definition for such a group G to correspond to a congruence group, Γ_G. Chen and Deligne proved that all metabelian groups G correspond to congruence. Chen also conjectured that all nonsolvable groups G correspond to noncongruence. For these reasons, it is interesting to study the influence of the derived length of G on the modular forms on Γ_G.

Madeline Dawsey (Emory University) `madeline.locus@emory.edu`

Effective Error Bounds for Andrews' Smallest Parts Function

ABSTRACT: We prove Chen's conjectured inequalities for the Andrews spt-function. The proof of these inequalities is complicated by the problem that the recently obtained Rademacher-type exact formula by Ahlgren and Andersen is conditionally convergent. Instead, we consider a different formula from Ahlgren and Andersen which expresses $\mathrm{spt}(n)$ as a finite sum of algebraic numbers, in the spirit of earlier work of Bruinier and Ono for $p(n)$. We obtain the first known effective error bounds for $\mathrm{spt}(n)$,

$$\mathrm{spt}(n) = \frac{\sqrt{3}}{\pi\sqrt{24n-1}} e^{\pi\sqrt{24n-1}/6} + E_s(n),$$

where for an explicitly defined constant C and a certain logarithmic expression $q(n)$, we have

$$|E_s(n)| < C \cdot 2^{q(n)} (24n-1)^2 e^{\pi\sqrt{24n-1}/12}.$$

Alexander Dunn (University of Illinois) `ajdunn2@illinois.edu`

Kloosterman sums for the Dedekind eta multiplier

ABSTRACT: In this talk we will discuss some new bounds for sums of Kloosterman sums attached to the Dedekind eta multiplier on the full modular group. Our estimates are uniform in many parameters, in analogy with recent work of Ahlgren–Andersen, and that of Sarnak–Tsimerman for the trivial multiplier. Our methods use the spectral theory of automorphic forms. We also obtain a refined bound whose quality depends on the factorization of $24m-23$ and $24n-23$, as well as the best known exponent for the Ramanujan–Petersson conjecture.

Asset Durmagambetov (L.N. Gumilyov Eurasian National University) aset.durmagambet@gmail.com

A pseudo zeta function

ABSTRACT: This work is dedicated to the promotion of the results Hadamard, Landau E., Walvis A., Estarmann T and Paul R. Chernoff for pseudo zeta functions. The properties of zeta functions are studied, these properties can lead to new regularities of zeta functions. On the basis of the obtained relations, an analytic continuation of the pseudo-zeta function is obtained. The analytic continuation leads to the truth of the Riemann hypothesis.

Melissa Emory (University of Missouri) mlenq2@mail.missouri.edu

On the global Gan-Gross-Prasad conjecture for general spin groups

ABSTRACT: In the 1990s, Benedict Gross and Dipendra Prasad formulated an intriguing conjecture connected with restriction laws for automorphic representations of a particular group. More recently, Gan, Gross, and Prasad extended this conjecture, now known as the *Gan-Gross-Prasad Conjecture*, to the remaining classical groups. Roughly speaking, they conjectured the non-vanishing of a certain period integral is equivalent to the non-vanishing of the central value of a certain L- function. Ichino and Ikeda refined the conjecture to give an explicit relationship between this central value of a L-function and the period integral. An analogous conjecture was formulated for unitary groups by R.N. Harris. We propose a similar conjecture for a non-classical group, the general spin group, and prove the first two cases. In the course of the proof we use the doubling method of Lapid-Rallis and the results of Kato-Murase-Sugano.

Dan Fretwell (University of Bristol) daniel.fretwell@bristol.ac.uk

An Eisenstein congruence for genus 2 Hilbert-Siegel forms

ABSTRACT: Congruences between modular forms have been a topic of interest for many years. They tell us a wealth of information about Galois representations and Selmer groups.

For classical modular forms one can study congruences between cusp forms and Eisenstein series, e.g. the Ramanujan 691 congruence for the discriminant function. Many results are known about these congruences in general, in particular the (significant) moduli mainly come from critical values of Dirichlet L-functions.

One can also study "Eisenstein congruences" over general reductive groups. In particular for $GSp4$ there is a long standing conjecture due to Harder, predicting similar congruences for genus 2 Siegel cusp forms. The modulus now comes from a critical value of the L-function of a genus 1 form.

In this talk I will formulate a generalization of this conjecture for Hilbert-Siegel forms and give computational evidence. To do this I will consider certain spaces of algebraic modular forms and provide algorithms for computing with such objects.

Solomon Friedberg (Boston College) `friedber@bc.edu`

Lifting via the converse theorem: new results

ABSTRACT: Langlands functoriality predicts maps between automorphic forms on different groups, dictated by a map of L-groups. One important class of such maps are endoscopic liftings, established by Arthur using the trace formula and relying on contributions from Ngo and Waldspurger, among others. In this talk I describe an approach to endoscopic lifting that does not use the trace formula. Instead it relies on the converse theorem of Cogdell and Piatetski-Shapiro and on new integral representations of L-functions of Cai, Friedberg, Ginzburg and Kaplan. This is joint work with Cai and Kaplan.

Michael Griffin (Brigham Young University) `mjgriffin@math.byu.edu`

Polya's Program for the Riemann Hypothesis and Related Problems

ABSTRACT: In 1927 Polya proved that the Riemann Hypothesis is equivalent to the hyperbolicity of Jensen polynomials for Riemann's Ξ-function. This hyperbolicity has only been proved for degrees $d = 1, 2, 3$. We prove the hyperbolicity of 100% of the Jensen polynomials of every degree. We obtain a general theorem which models such polynomials by Hermite polynomials. This theorem also allows us to prove a conjecture of Chen, Jia, and Wang on the partition function. This is joint work with Ken Ono, Larry Rolen, and Don Zagier.

Jonathan Hales (Brigham Young University) `Jonathanrhales@gmail.com`

Congruences for Modular Parameterizations of Elliptic Curves

ABSTRACT: The modularity theorem gives that for every elliptic curve $E/\mathbb{Q}$, there exists a rational map from the modular curve $X_0(N)$ to E, where N is the conductor of E. This map may be expressed in terms of two modular functions $X(\tau)$ and $Y(\tau)$ (derived from the Weierstrass $\wp$-function and its derivative) where $X(\tau)$ and $Y(\tau)$ satisfy the equation for E. We examine interesting congruences between the Q-algebras generated by $X(\tau)$ and $Y(\tau)$. We also calculate the divisors of the modular functions $X(\tau)$ and $Y(\tau)$ and the pre-images of rational points on E. As in work of Kodgis and Peluse, we find that many of these pre-images are CM points with discriminants related to the conductor of E. However, we show this is not always the case. This is joint work with Dr. Michael Griffin.

Adrian Hauffe-Waschbüsch (RWTH Aachen) `adrian.hauffe@matha.rwth-aachen.de`

Isomorphism between the Symplectic group over Quaternion and the Orthogonal group SO(2,6)

ABSTRACT: The Symplectic group over Quaternions of degree n is an analogue to the well known real Symplectic group. Like the Siegel modular group the Symplectic modular group over Quaternions acts on a half space and you can study the associated modular form. In this talk we will concentrate on the Symplectic group over Quaternions of degree 2 and construct an explicit isomorphism to the Orthogonal group $SO(2,6)$, which preserves the action on the associated half space. A further analysis of this isomorphism shows that it also acts nicely on some special subgroups of the Symplectic group.

Xiaoguang He (Shandong University/Penn State University) `hexiaoguangsdu@gmail.com`

On the first sign change of Fourier Coefficients of Cusp Forms

ABSTRACT: In this talk, I will give some history about sign change of Fourier Coefficients of Cusp Forms, and then I will give a proof of my recent result as follows. Let f be a non-zero cusp form of even integral weight $k \geq 2$ on the Hecke congruence subgroup $\Gamma_0(N)$ with N square-free. Suppose that the normalized Fourier coefficients $\lambda_f(n)$ of f are real. We prove that the first sign change of $\lambda_f(n)$ occurs in the range $n \ll (kN)^{2+\varepsilon}$. This improves upon the earlier result of Choie and Kohnen. This is joint work with Lilu Zhao.

Peter Humphries (University College London) `pclhumphries@gmail.com`

Quantum unique ergodicity in almost every shrinking ball

ABSTRACT: A well-known conjecture of Berry states that eigenfunctions f of the Laplacian on a finite volume negatively curved manifold M should behave like random waves as the Laplacian eigenvalue tends to infinity. One manifestation of this conjecture is quantum unique ergodicity on configuration space, which states that the probability measures $|f|^2 d\mu$ converge weakly to the uniform measure $d\mu$ on M. For $M = \Gamma\backslash H$, these eigenfunctions are Maass forms, and this conjecture is a celebrated theorem of Lindenstrauss and Soundararajan. It is natural to ask whether equidistribution of these measures still occurs in balls centred at fixed points in $M = \Gamma\backslash H$ whose radii shrink as the Laplacian eigenvalue tends to infinity. We show that if the radius shrinks faster than the Planck scale, equidistribution may fail, and we discuss how to prove (conditional or unconditional) results towards equidistribution for balls shrinking at any scale larger than the Planck scale that are centred at almost every point in $M = \Gamma\backslash H$.

Bo-Hae Im (Korea Advanced Institute of Science and Technology) `bhim@kaist.ac.kr`

Zeros of weakly holomorphic modular forms for some Fricke groups

ABSTRACT: In this talk, I will talk about the locations of zeros of certain weakly holomorphic modular forms for the Fricke groups of low levels. Also I will talk about the special property that the zeros of them interlace. This is a joint work with SoYoung Choi.

Yeongseong Jo (Ohio State University) jo.59@osu.edu

The Local Exterior Square L-functions for $GL(n)$

ABSTRACT: In mid 1990's Cogdell and Piatetski-Shapiro embarked a project to compute the local exterior square L-functions through integral representations of Jacquet and Shalika. In this talk I describe how one can express those L-functions for irreducible admissible generic representations of $GL(n)$ in terms of L-functions for the inducing datum. The main two ingredients for this computation are exceptional poles and the method of derivatives due to Bernstein and Zelevinsky. I also explain that the exterior square Artin L-functions agree with analytic L-functions for $GL(n)$.

Jetjaroen Klangwang (Oregon State University) klangwaj@oregonstate.edu

Zero of certain modular forms of weight nk

ABSTRACT: We prove that for sufficient large k, all zeros of the modular forms $E_k^2 + E_{2k}$ and $E_k^3 + E_{3k}$ in the fundamental domain for the full modular group lie on the lower boundary. Our method utilizes work of F.K.C. Rankin and Swinnerton-Dyer.

Kim Klinger-Logan (University of Minnesota) kling202@umn.edu

Meromorphic continuation of solutions to differential equations in automorphic forms

ABSTRACT: Physicists such as Green, Vanhove, et al show that differential equations involving automorphic forms govern the behavior of gravitons. One particular point of interest is solutions to $(\Delta - \lambda)u = E_\alpha E_\beta$ on an arithmetic quotient of the exceptional group E_8. We use spectral theory solve $(\Delta - \lambda)u = E_\alpha E_\beta$ on the simpler space $SL_2(\mathbb{Z})\backslash SL_2(\mathbb{R})$. The construction of such a solution uses Arthur truncation, the Maass-Selberg formula, and automorphic Sobolev spaces. In this talk I will focus on meromorphic continuation on the solution.

Krzysztof Klosin (Princeton University) kklosin@qc.cuny.edu

The Paramodular Conjecture for abelian surfaces with rational torsion

ABSTRACT: The Paramodular Conjecture can be viewed as an analog of the Taniyama-Shimura Conjecture for abelian surfaces. We will discuss recent progress on the conjecture in the case when the abelian surface has rational torsion. This is joint work with T. Berger.

Spencer Leslie (Boston College) winston.leslie@bc.edu

A Generalized Theta lifting and CAP representations

ABSTRACT: We discuss a new lifting of automorphic representations using the generalized theta representation on the higher degree covers of the symplectic group, with special emphasis on the four-fold cover. In this case, the lift produces CAP representations, giving counterexamples of the generalized Ramanujan conjecture. This motivates a connection to the emerging "Langlands program for covering groups" by way of Arthur parameters. The crucial fact allowing this lift to work is that theta functions for the 4-fold cover still have few non-vanishing Fourier coefficients, which fails for higher-degree covers.

Huixi Li (Clemson University) huixil@g.clemson.edu

Congruence primes of Hilbert Siegel eigenforms

ABSTRACT: Congruence between modular forms plays an important role in number theory. For example, it is an important ingredient in the proof of the Herbrand-Ribet theorem and the Iwasawa main conjecture for GL_2. In this presentation I will provide a sufficient condition for a prime ℓ to be a congruence prime for a Hilbert Siegel eigenform f for a large class of totally real fields F via a divisibility of a special value of the standard L-function associated to f. In the special case that $F = \mathbb{Q}$ and f is an Ikeda lift, we recover an earlier result of Brown-Keaton as a special case of our main theorem. This is joint work with Jim Brown.

Wanlin Li (University of Wisconsin, Madison) wanlin@math.wisc.edu

Vanishing of hyperelliptic L-functions at the central point

ABSTRACT: We obtain a lower bound on the number of quadratic Dirichlet L-functions over the rational function field which vanish at the central point $s = 1/2$. This is in contrast with the situation over the rational numbers, where a conjecture of Chowla predicts there should be no such L-functions. The approach is based on the observation that vanishing at the central point can be interpreted geometrically, as the existence of a map to a fixed abelian variety from the hyperelliptic curve associated to the character.

Yongxiao Lin (Ohio State University) lin.1765@osu.edu

Subconvex bound for twists of $GL(3)$ L-functions

ABSTRACT: Let π be a fixed Hecke-Maass cusp form for $\mathrm{SL}(3,\mathbb{Z})$ and χ be a primitive Dirichlet character modulo M, which we assume to be a prime. Let $L(s,\pi\otimes\chi)$ be the L-function associated to $\pi\otimes\chi$. In this talk, we will describe our work in establishing a subconvex bound $L(1/2+it,\pi\otimes\chi) \ll (M|t|)^{3/4-\delta}$ for any $\delta < 1/36$, simultaneously in both the conductor and t aspects.

Benjamin Linowitz (Oberlin College) benjamin.linowitz@oberlin.edu

Brauer equivalent number fields

ABSTRACT: Two number fields are said to be Brauer equivalent if there exists an isomorphism between their Brauer groups that commutes with restriction. In this talk we will describe a number of results concerning Brauer equivalent number fields (i.e, they must have the same signature, group of roots of unity, etc). These results will then be applied to the study of quaternionic Shimura varieties.

Jingbo Liu (University of Hong Kong) jliu02@hku.hk

Universal sums of generalized m-gonal numbers

ABSTRACT: Conway–Schneeberger Fifteen Theorem states that a given positive definite integral quadratic form is universal (i.e., represents every positive integer) if and only if it represents all the positive integers up to 15. We are interested in generalizing this question to sums of generalized m-gonal numbers with positive coefficients:

$$f(x) = \sum_{j=1}^{n} a_j P_m(x_j)$$

where

$$P_m(x) := \frac{(m-2)x^2 - (m-4)x}{2}, \quad x \in \mathbb{Z}.$$

Let $\gamma(m)$ be the smallest positive integer such that f is universal if and only if every positive integer less than or equal to $\gamma(m)$ is represented by f. We have known that $\gamma(3) = \gamma(6) = 8$ and $\gamma(4) = 15$. Recently Ju and Oh have proven that $\gamma(8) = 60$. In this talk, we will approach this problem from both algebraic and analytic sides and determine an asymptotic upper bound, as a function of m, for $\gamma(m)$. This is a joint work with Ben Kane.

Shenhui Liu (University of Toronto) sliu@math.toronto.edu

Central L-values of $GL(3)$ Maass forms

ABSTRACT: In this talk, we are concerned with certain $GL(3)$ L-functions at the central point of the critical strip. Specifically, consider an orthogonal basis $\{\phi_j\}$ of Hecke-Maass forms for $SL(3, \mathbb{Z})$. By the method of moments and the mollification method, we obtain a positive-proportional non-vanishing result for $L(1/2, \phi_j)$ when the spectral parameters of ϕ_j are concentrated around a large parameter T. The main tool we use is the $GL(3)$ Kuznetsov formula. This is joint work with Bingrong Huang and Zhao Xu.

David Lowry-Duda (University of Warwick) djlowry@math.brown.edu

Counting points on one-sheeted hyperboloids

ABSTRACT: In this talk, we discuss asymptotics for the number of lattice points in a ball of radius R around the origin and lying on the one-sheeted hyperboloid $x_1^2 + \cdots + x_k^2 = x_{d+1}^2 + h$. Counting these lattice points is a problem very similar in flavor to the generalized Gauss circle problem, which concerns counting all lattice points lying within a d-dimensional sphere of radius R. We describe ideas and techniques from shifted convolution sums and modular forms leading to improved results on both sharp and smoothed asymptotics.

Alvaro Lozano-Robledo (University of Connecticut) alvaro.lozano-robledo@uconn.edu

A probabilistic model for the ranks of elliptic curves over $\mathbb{Q}$

ABSTRACT: In this talk, we propose a probabilistic model for the distribution of ranks of elliptic curves in families of fixed Selmer rank, and compare the predictions with previous results, and with the databases of curves over the rationals that we have at our disposal. The model itself is built in the spirit of Cramér's model for the prime numbers.

Jolanta Marzec (University of Silesia) jolanta.marzec@us.edu.pl

Maass relations for Saito-Kurokawa lifts of higher levels

ABSTRACT: It is known that a Siegel modular form is a (classical) Saito-Kurokawa lift of an elliptic modular form if and only if its Fourier coefficients satisfy the Maass relations. The first construction of such a lift was given by Maass using correspondences between various modular forms. However, in order to generalize this lift to higher levels it is easier to use a construction coming from representation theory. The question is whether one can still read off the Maass relations from such a construction. We show that this is indeed the case by generalizing an approach of Pitale, Saha and Schmidt from the classical to a higher level case.

Dermot McCarthy (Texas Tech University) dermot.mccarthy@ttu.edu

Sequences, Modular Forms and Cellular Integrals

ABSTRACT: The Apéry numbers, which arise in the irrationality proofs for $\zeta(2)$ and $\zeta(3)$, satisfy many intriguing arithmetic properties, and are also related to the p-th Fourier coefficients of modular forms. We describe sequences associated to Brown's cellular integrals, of which the Apéry numbers are special cases. We discuss recent work on proving that the connection to modular forms persists for these sequences in general.

Robert McDonald (University of Connecticut) robert.j.mcdonald@uconn.edu

Torsion Subgroups of Elliptic Curves over Function Fields

ABSTRACT: Let $K = \mathbb{F}_q(T)$ be a function field over a finite field of characteristic p, and E/K be an elliptic curve. It is known that $E(K)$ is a finitely generated abelian group, and that for a given p, there is a finite, effectively calculable, list of possible torsion subgroups which can appear. In this talk, we show the complete list of possible full torsion subgroups which can appear, and appear infinitely often, for a given p. We will also discuss work in progress for function fields of higher genus.

Harsh Mehta (University of South Carolina) harshosaurus@gmail.com

Malle's conjecture on a family of Frobenius groups

ABSTRACT: Malle's conjecture concerns the asymptotics of the number of number fields with a given Galois group up to a certain discriminant as the discriminant tends to infinity. We study what is known and talk about new results concerning this conjecture in the case that we have Frobenius groups

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Michael Mertens (University of Cologne) mmertens@math.uni-koeln.de

Modular forms of real-arithmetic types

ABSTRACT: The theory of elliptic modular forms has gained significant momentum from the discovery of relaxed yet well-behaved notions of modularity, such as mock modular forms, higher order modular forms, and iterated integrals. In this talk, we propose a unified framework for these notions as vector-valued modular forms with respect to a new class of arithmetic types which we call virtually real-arithmetic (vra) types. Some aspects of the theory of vra type modular forms such as rationality results for their Fourier and Taylor coefficients, Petersson pairings, and Hecke theory will be highlighted. This is joint work with Martin Raum.

Djordje Milicevic (Bryn Mawr College) dmilicevic@brynmawr.edu

The sup-norm problem for GL(2) *over number fields*

ABSTRACT: The sup-norm problem occupies a prominent position at the interface of automorphic forms, analytic number theory, and analysis. It asks for bounds on the pointwise values of an L^2-normalized eigenfunction (in arithmetic contexts, an appropriately normalized automorphic form) in terms of its Laplacian eigenvalue or other increasing parameters.

In this talk, we will present our recent bounds solving the sup-norm problem for spherical Hecke–Maaß newforms of square-free level for the group GL(2) over a number field, with a power saving over the local geometric bound simultaneously in the eigenvalue and the level aspect. Our bounds feature a Weyl-type exponent in the level aspect, they reproduce or improve upon all known special cases, and over totally real fields they are as strong as the best known hybrid result over the rationals.

The talk will emphasize several new features and difficulties that the number field setting (and specifically complex places) introduces and new techniques we developed to address them, which are also of independent interest.

Steven J. Miller (Williams College) and **Ezra Waxman** (Tel Aviv University)
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Lower Order Terms for the Variance of Gaussian Primes across Sectors

ABSTRACT: A Gaussian prime is a prime element in the ring of Gaussian integers $\mathbb{Z}[i]$. As the Gaussian integers lie on the plane, interesting questions about their geometric properties can be asked, which have no classical analogue among the ordinary primes. Specifically, to each Gaussian prime $a + bi$, we may associate an angle whose tangent is the ratio $b = a$. Hecke showed that these angles are uniformly distributed as p varies, and Kubilius proved uniform distribution in somewhat short arcs. Motivated by a random matrix theory (RMT) model and a function eld analogue, Rudnick and Waxman gave a conjecture for the variance of such angles across short arcs. While many number theoretic results show agreement between the main term of a calculation and RMT, far fewer results exist about the secondary terms, in which the arithmetic properties are found. In this work, we apply the L-Function Ratios Conjecture to a family of Hecke L-functions to derive a formula which computes the variance of Gaussian primes across short arcs, and compare this (theoretically and experimentally) with results from number theory.

Grant Molnar (Brigham Young University) gmolnar@mathematics.byu.edu

Zagier Duality for Level p Weakly Holomorphic Modular Forms

ABSTRACT: We prove Zagier duality between the Fourier coefficients of canonical bases for spaces of weakly holomorphic modular forms of prime level p with $11 \leq p \leq 37$ with poles only at the cusp at ∞, and special cases of duality for an infinite class of prime levels. We derive generating functions for the bases for genus 1 levels.

Eric Moss (Brigham Young University) ericbm2@gmail.com

Congruences for coefficients of modular functions with poles at 0

ABSTRACT: We give congruences modulo powers of 2 for the Fourier coefficients of certain level 2 modular functions with poles only at 0, answering a question posed by Andersen and Jenkins. The congruences involve a modulus that depends on the binary expansion of the modular form's order of vanishing at infinity. This is joint work with Paul Jenkins and Ryan Keck.

Aftab Pande (Universidade Federal do Rio de Janeiro) aftab.pande@gmail.com

Reductions of crystalline representations of slope $(2, 3)$

ABSTRACT: Using the mod p Local Langlands correspondence for $GL_2(Q_p)$, we describe the semisimplification of the mod p reduction of 2-dimensional crystalline representations of slope $(2, 3)$ building on work of Buzzard-Gee and Bhattacharya-Ghate. This is joint work with Enno Nagel.

Solly Parenti (University of Wisconsin, Madison) sparenti@wisc.edu

Unitary CM Fields and the Colmez Conjecture

ABSTRACT: In 1993, Pierre Colmez conjectured a relation between the Faltings height of a CM abelian variety and certain log derivatives of L-functions associated to the CM type, generalizing the classical Chowla-Selberg formula. I will discuss how we can extend the known cases of the conjecture to a certain class of unitary CM fields using the recently proven average version of the conjecture.

Ian Petrow (ETH Zurich) ian.petrow@math.ethz.ch

Counting Automorphic Characters of Tori

ABSTRACT: A natural question in the analytic theory of automorphic forms is: "how many automorphic forms (representations) are there on a given group?" Very little is known about this question in the case of a general group. In this talk I will describe recent work on this question in the case that the group is an algebraic torus.

Neha Prabhu (Queen's University) neha.prabhu@queensu.ca

Moments of the error term in the Sato-Tate law on average

ABSTRACT: The Sato-Tate theorem for non-CM elliptic curves and modular forms is known due to the deep work of Taylor et al. However, on averaging over appropriate families, an average Sato-Tate result is obtained relatively easily. Visualizing the average result as a theorem about the first moment, one can study the higher moments of the error term in the average theorems and obtain a central limit theorem under suitable hypothesis. The talk will comprise of describing the results obtained in the case of modular forms and elliptic curves.

Kyle Pratt (University of Illinois at Urbana-Champaign) kpratt4@illinois.edu

Critical zeros of the Riemann zeta function

ABSTRACT: I will briefly discuss the history of finding zeros of zeta on the critical line, and discuss recent joint work with Nicolas Robles in which we increase slightly increase the known percentage of zeros on the critical line. The problem boils down to finding cancellation in sums of Kloosterman-type sums.

Wissam Raji (American University of Beirut) wr07@aub.edu.lb

Special values of Hecke L-functions of modular forms of half-integral weight and cohomology

ABSTRACT: The famous Eichler-Shimura theorem states that two copies of the space of cusp forms of integer weight k for the full modular group are isomorphic to the cohomology group of periods. The theory of Eichler-Shimura plays an important role in the theory of integral weight modular forms, connecting e.g. to elliptic curves, critical values of L-functions and Hecke operators. We start developing a cohomology theory in the case of half-integral weight with an attempt to focus again on the connection to special values of $L_f(s)$ at half-integral and integral points inside the "critical strip", similar as in the case of integral weight. (with Winfried Kohnen)

Anwesh Ray (Cornell University) ar2222@cornell.edu

Geometric Lifts of Mod p Reducible Galois Representations

ABSTRACT: Classically, the deformation theory of Galois Representations is well known for mod p representations that (in addition to being unramified outside finitely many primes and satisfying some technical local conditions) are irreducible. Hamblen and Ramakrishna provide a method of constructing geometric lifts of 2 dimensional mod p Galois representations that are allowed to be reducible and indecomposable, thereby relaxing this hypothesis. These characteristic zero geometric lifts are indeed modular by the modularity theorem of Skinner and Wiles. We will review some features of their construction and potential applications to the study of the Galois module structure of class groups of number fields. We will then talk of higher dimensional analogues of their result.

Mishty Ray (Oklahoma State University) mishty.ray@okstate.edu

Tate's thesis and its applications

ABSTRACT: Tate's thesis is the setting for the functional equation of a $GL(1)$ automorphic form. Hecke provided a generalization for Dirichlet L functions by introducing the Hecke character (otherwise known as Grossencharakter), which was used to define the Hecke L-series, and derive the functional equation. Tate, in his 1950 thesis, elegantly reworked this theory using the adelic language and Fourier analysis. In this talk, I will outline the derivation of the local and global functional equations. Learning this theory provides a segue into the theory automorphic forms and their L functions. Note. This talk is expository.

Eugenia Rosu (University of Arizona) rosu@math.arizona.edu

Twists of elliptic curves with CM

ABSTRACT: We consider certain families of sextic twists of the elliptic curve $y^2 = x^3 + 1$ that are not defined over $\mathbb{Q}$, but over $\mathbb{Q}[\sqrt{-3}]$. We compute a formula that relates the value of the L-function $L(E_D, 1)$ to the trace of a modular function at a CM point. Assuming the Birch and Swinnerton-Dyer conjecture, when the value above is non-zero, we should recover the order of the Tate-Shafarevich group.

Nathan Ryan (Bucknell University) nathan.ryan@bucknell.edu

Computing Hecke eigenvalues analytically

ABSTRACT: There are lots of methods to compute Hecke eigenvalues of modular forms. We discuss the following simple method: for a Hecke eigenform F (classical, Siegel, Hilbert, whatever) we know that $T_p(F) = \lambda_p F$, the equality being of functions. So, if we could develop methods to evaluate modular forms at points in the upper half space, we should be able to calculate the Hecke eigenvalue λ_p. We discuss implementations and results when F is a classical modular form and when F is a Siegel modular form. This is joint work with David Armendáriz, Owen Colman, Alexandru Ghitza, and Darío Terán.

Abhishek Saha (Queen Mary University of London) abhishek.saha@gmail.com

Integral representation and critical L-values for the standard L-function of a Siegel modular form

ABSTRACT: I will talk about some of my recent work with Pitale and Schmidt where we prove an explicit pullback formula that gives an integral representation for the twisted standard L-function for a holomorphic vector-valued Siegel cusp form of degree n and arbitrary level. In contrast to all previously proved pullback formulas in this situation, our formula involves only scalar-valued functions despite being applicable to L-functions of vector-valued Siegel cusp forms. Further, by specializing our integral representation to the case $n = 2$, we prove an algebraicity result (in the spirit of Deligne's conjecture) for the critical L-values (generalizing previously proved critical-value results for the full level case). Furthermore, as an application of this last result, we obtain the algebraicity of the critical values of the symmetric fourth L-function of a classical newform.

Jyotirmoy Sengupta (Tata Institute of fundamental Research) sengupta@math.tifr.res.in

A case of simultaneous nonvanishing of automorphic L functions

ABSTRACT: Let $k \geq 12$ be an even integer. In this talk we will give a formula for the weighted sum of $L(1/2, f)L(1/2, sym^2 f)$ as f ranges over primitive forms of weight k and level q. Here q is a prime.. As a corollary we deduce that there exists a computable constant q_k such that there is a primitive form f of weight k and level $q > q_k$ having the property that $L(1/2, f)$ and $L(1/2, sym^2 f)$ are both nonzero.

Vlad Serban (University of Vienna) vlad.serban@univie.ac.at

Classical automorphic forms on p-adic families for GL2

ABSTRACT: We discuss when families of p-adic automorphic forms for $GL2$ over a number field F contain few classical automorphic forms and present results and examples when F is imaginary quadratic.

Sheng-Chi Shih (University of Arizona) `sshih@math.arizona.edu`

On congruence modules related to Hilbert Eisenstein series

ABSTRACT: The Iwasawa main conjecture asserts a relationship between certain p-adic L-functions and characteristic polynomials associated with the p-part of the class group of the cyclotomic $\mathbb{Z}_p$-extension of an abelian extension of $\mathbb{Q}$. The main conjecture over abelian extensions of $\mathbb{Q}$ was first proved by Mazur and Wiles using 2-dimensional Galois representations attached to cusp forms that are congruent to ordinary Eisenstein series. Wiles generalized the method of Mazur-Wiles to the setting of Hilbert modular forms and proved the main conjecture over totally real fields. A few years later, Ohta gave a refinement of Wiles's proof of the main conjecture over abelian extensions of $\mathbb{Q}$ by constructing Galois representations attached to cusp forms using the action of $\mathrm{Gal}(\overline{\mathbb{Q}}/\mathbb{Q})$ on the cohomology of modular curves. One of the key steps in Ohta's proof is to compute the congruence modules related to Eisenstein series. In this talk, we will talk about how to generalize Ohta's work on congruence modules to the setting of Hilbert modular forms.

Ari Shnidman (Boston College)

A higher order Gross-Kohnen-Zagier formula over function fields

ABSTRACT: I'll present a formula for the intersection pairing of two different Heegner-Drinfeld cycles in terms of derivatives of toric period integrals, for unramified automorphic representations on $PGL(2)$. This is a higher order analogue of the Gross-Kohnen-Zagier formula in the function field setting, and provides a non-vanishing criterion for the rth central derivative of the L-function. Joint work with Ben Howard.

Nicolás Sirolli (Universidad de Buenos Aires) `nsirolli@dm.uba.ar`

Explicit Waldspurger formulas for Hilbert modular forms

ABSTRACT: We describe a construction of preimages for the Shimura map on Hilbert modular forms using generalized theta series, and give an explicit Waldspurger type formula relating their Fourier coefficients to central values of twisted L-functions. Our construction is inspired by that of Gross and applies to any nontrivial level and arbitrary base field, subject to certain conditions on the Atkin-Lehner eigenvalues and on the weight. Furthermore, the formula gives information about these values even when the main central value vanishes.

Polyxeni Spilioti (University of Tuebingen) `polyxeni.spilioti@uni-tuebingen.de`

Ruelle and Selberg zeta functions for non-unitary twists

ABSTRACT: A variety of topics in the field of spectral geometry are concerned with the study of the dynamical zeta functions of Ruelle and Selberg and their relation to spectral invariants such as the eta invariant associated with Dirac-type operators and the analytic torsion. We consider the dynamical zeta functions for non-unitary representations of the fundamental group, which are attached to the geodesic flow on the unit tangent bundle over a hyperbolic manifold and prove that they admit meromorphic continuation to the whole complex plane and further that they satisfy functional equations.

Karen Taylor (Bronx Community College and Byrn Mawr College) karen.taylor@bcc.cuny.edu

Quadratic Identities and Maass Waveforms

ABSTRACT: Andrews, Dyson and Hickerson (ADH) studied the Fourier coefficients of the function

$$\sigma(q) = 1 + \sum_{n=1}^{\infty} \frac{q^{\frac{n(n+1)}{2}}}{(1+q)(1+q^2)\cdots(1+q^n)},$$

where σ is a function that appears in the work of Ramanujan. They prove, among other things, that the nth Fourier coefficient is given by

$T(24n+1) =$

equivalence classes $[(x,y)]$ of solutions to $x^2 - 6y^2 = 24n+1$ with $x + 3y \equiv \pm 1 \mod 12$

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equivalence classes $[(x,y)]$ of solutions to $x^2 - 6y^2 = 24n+1$ with $x + 3y \equiv \pm 5 \mod 12$

Cohen showed that

$$\phi_0(\tau) = y^{\frac{1}{2}} \sum_{\substack{n\in\mathbb{Z}\\ n\neq 0}} T(n) e^{\frac{2\pi i n x}{24}} K_0\left(\frac{2\pi|n|y}{24}\right)$$

is a Maass waveform on $\Gamma_0(2)$. Zwegers was able to place $\phi_0(\tau)$ in a larger framework of indefinite theta functions.

In this talk, I will discuss the problem of placing quadratic identities arising in the work of ADH into a modular framework. This is joint work, in progress, with Larry Rolen.

Frank Thorne (University of South Carolina) thorne@math.sc.edu

The Distribution of G-Weyl CM Fields and the Colmez Conjecture

ABSTRACT: A conjecture of Colmez relates the Faltings height of a CM abelian variety to logarithmic derivatives of Artin L-functions at $s = 0$. Based on my coauthors' previous work, I will outline a proof that the conjecture holds for 100% of CM fields of any fixed degree, when ordered by discriminant. This is joint work with Adrian Barquero-Sanchez and Riad Masri.

Jesse Thorner (Stanford University) jthorner@stanford.edu

Weak subconvexity without a Ramanujan hypothesis

ABSTRACT: (Joint work with Kannan Soundararajan.) Let f be a cuspidal automorphic representation of $\mathrm{GL}(m)$, and let $L(s,f)$ be its associated L-function. The Phragmén-Lindel of principle produces the so-called "convexity bound" $L(1/2,f) \ll_\epsilon C(f)^{1/4+\epsilon}$ for central values of L-functions, where $C(f)$ is the analytic conductor of f. Assuming a weak form of the Ramanujan conjecture, Soundararajan proved the uniform bound $L(1/2,f) \ll_{\epsilon,m} C(f)^{1/4}/(\log C(f))^{1-\epsilon}$. We will unconditionally show that $L(1/2,f) \ll_m C(f)^{1/4}/(\log C(f))^{\delta}$ for some small $\delta > 0$. A similar result holds for Rankin-Selberg L-functions.

Long Tran (University of Oklahoma) `ltran@math.ou.edu`

L-factors for the p-adic groups GSp(4)

ABSTRACT: In this talk, I will be presenting the Piatetski-Shapiro's theory of zeta integrals via Bessel models to calculate local L-factors for irreducible admissible representations of $GSp(4)$ over the local fields.

Wei-Lun Tsai (Texas A&M University) `wltsai@math.tamu.edu`

Analytic formulas for Stark units in quadratic extensions of totally real number fields

ABSTRACT: In this talk, we will explain how Stark units in certain quadratic extensions of totally real number fields can be evaluated explicitly in terms of values of the Barnes multiple Gamma function at algebraic arguments. This is joint work with Adrian Barquero-Sanchez and Riad Masri.

Cindy Tsang (YMSC Tsinghua University) `sinyitsang@mail.tsinghua.edu.cn`

The number of D_4-fields with monogenic cubic resolvent ordered by conductor

ABSTRACT: We give the asymptotic number of D_4-fields whose ring of integers contains a monogenic cubic resolvent ordered by conductor. It turns out that this problem reduces to that of counting $\mathrm{GL}_2(\mathbb{Z})$-equivalence classes of integral and irreducible binary quartic forms with Galois group isomorphic to D_4 satisfying a special algebraic property. Integral and irreducible binary quartic forms with Galois group isomorphic to D_4 in turn may be parametrized by integral binary quadratic forms $\mathcal{J}(x, y)$ of non-zero discriminant. A key observation in our work is that, once we impose the special algebraic property, up to $\mathrm{GL}_2(\mathbb{Z})$-equivalence there are only three such $\mathcal{J}(x, y)$ that need to be considered. This is joint work with S. Y. Xiao.

An Hoa Vu (City University of New York) `avu@gradcenter.cuny.edu`

Hermitian Saito-Kurokawa lift for general level

ABSTRACT: The classical Saito-Kurokawa lift has many applications in number theory. For level 1, the hermitian analogue for $\mathbb{Q}(i)$ has been constructed by Kojima and for general imaginary quadratic fields by Krieg. For higher level, it was partially constructed by Berger and Klosin. In this talk, I will construct of Hermitian Saito-Kurokawa lift (also called Hermitian Maass lift in the literature) for general level.

Siddhesh Wagh (University of Oklahoma) `waghsiddhesh@gmail.com`

Liftings of Maass forms from SL2 to GL2 over a Division Quaternion Algebra

ABSTRACT: I will be talking about my research which is about identifying the Maass space for a particular Saito-Kurokawa like lifting described in a paper by Muto, Narita and Pitale. Methods used by Maass for the SK problem don?t work here and a new approach is necessary. We will use both the classical and representation theory approach to tackle the problem.

Ezra Waxman (Tel Aviv University) and **Steven J. Miller** (Williams College)
ewaxman@post.tau.ac.il sjm1@williams.edu

Lower Order Terms for the Variance of Gaussian Primes across Sectors

ABSTRACT: A Gaussian prime is a prime element in the ring of Gaussian integers $\mathbb{Z}[i]$. As the Gaussian integers lie on the plane, interesting questions about their geometric properties can be asked, which have no classical analogue among the ordinary primes. Specifically, to each Gaussian prime $a + bi$, we may associate an angle whose tangent is the ratio $b = a$. Hecke showed that these angles are uniformly distributed as p varies, and Kubilius proved uniform distribution in somewhat short arcs. Motivated by a random matrix theory (RMT) model and a function eld analogue, Rudnick and Waxman gave a conjecture for the variance of such angles across short arcs. While many number theoretic results show agreement between the main term of a calculation and RMT, far fewer results exist about the secondary terms, in which the arithmetic properties are found. In this work, we apply the L-Function Ratios Conjecture to a family of Hecke L-functions to derive a formula which computes the variance of Gaussian primes across short arcs, and compare this (theoretically and experimentally) with results from number theory.

Ariel Weiss (University of Sheffield) a.weiss@sheffield.ac.uk

Irreducibility of Galois representations associated to low weight Siegel modular forms

ABSTRACT: If f is a classical modular form of weight $k > 1$, Ribet showed that its associated p-adic Galois representation is irreducible for all primes, and that its mod p Galois representation is irreducible for almost all primes. An immediate corollary is that a modular form can only be congruent to an Eisenstein series modulo finitely many primes. In this talk, I will show how this theorem can be generalised to the Galois representations arising from low weight Siegel modular forms.

Matthew Welsh (Rutgers University) mcw135@math.rutgers.edu

The Spacing of Torsion Points

ABSTRACT: The spacing of fractions a/q, with q at most Q, is at first easy to understand. However, they have profound implications as manifested by the additive and multiplicative large sieve inequalities. Motivated by the question, "is Dirichlet's theorem on simultaneous Diophantine approximation optimal?", we discuss the spacing of pairs of fractions $(a/q, b/q)$, which can be thought of as the torsion points on $\mathbb{R}^2/\mathbb{Z}^2$.

Annalena Wernz (RWTH Aachen University) annalena.wernz@matha.rwth-aachen.de

The isomorphism between the Hermitian modular group and $O(2,4)$

ABSTRACT: The Hermitian modular group $U(n,n;\mathcal{O}_K)$ of degree n over an imaginary quadratic field $K = \mathbb{Q}(\sqrt{-m})$ was introduced by Hel Braun in the 1940s as an analogue for the well known Siegel modular group. It is a subgroup of the special unitary group $SU(n,n,\mathbb{C})$ and for $n = 2$ it is isomorphic to the orthogonal group $O(2,4)$. For $m = 1,2,3$, Kloecker showed in 2005 that the Hermitian modular group is isomorphic to a subgroup of $O(2,4)$. In my talk, I consider arbitrary $m \neq 1,3$ and show that the Hermitian modular group is isomorphic to the discriminant kernel of the orthogonal group $O(2,4)$. Furthermore, I compute the normalizer of the Hermitian modular group in the unitary group and show that it is isomorphic to the integral orthogonal group.

Jordan Wiebe (University of Oklahoma) jwiebe@math.ou.edu

Constructing Orders with Level

ABSTRACT: Orders with level in quaternion algebras yield arithmetic results in many areas of number theory, such as the construction of modular forms with the same level. In this talk, I will describe the construction of an order with arbitrary level for any quaternion algebra over the rationals, as well as associated computations and results.

Liang Xiao (University of Connecticut) xiaoliangmit@gmail.com

Some remarks on the ghost conjecture of Bergdall and Pollack

ABSTRACT: Bergdall and Pollack proposed an interesting conjecture that is expected to give the p-adic slopes of modular forms. We explain how to formulate an analogous conjecture in a purely representation theoretic framework, and explain how this is related to the conjectures on Kisin's crystalline deformation spaces. This is a joint work with Ruochuan Liu and Bin Zhao.

Liyang Yang (Caltech) lyyang@caltech.edu

Arithmetic Applications of Eisenstein Periods

ABSTRACT: We show that the central value of class group L-functions of CM fields can be expressed in terms of derivatives of real-analytic Hilbert Eisenstein series at CM points. This gives explicit lowers bound for class numbers of a family of CM fields. Other arithmetic applications include mean value of these twisted class group L-functions at $s = 1/2$, a better lower bound for nonvanishing class group L-functions and their derivatives at the central value. We also obtain some (both conditional and unconditional) nonvanishing results.

Dongxi Ye (University of Wisconsin, Madison) dye4@wisc.edu

Difference of a Hauptmodul for $\Gamma_0(N)$ and Certain Gross-Zagier Type CM Value Formulas

ABSTRACT: In this talk, I will first review the celebrated Monster denominator formula and Gross-Zagier CM value formula, and their relationship with Borcherds lifting. I will then present some new extensions of these two famous formulas.

Rongqing Ye (Ohio State University) ye.352@osu.edu

Rankin-Selberg gamma factors over local field and its residue field

ABSTRACT: Depth zero cuspidal representations of a general linear group over a p-adic local field come from cuspidal representations over its residue field. Thus these two kinds of representations are closely related. In this talk, we reveal their relations in terms of Rankin-Selberg gamma factors. Indeed, we are going to show that their Rankin-Selberg gamma factors are the same, possibly up to a constant.

Qing Zhang (Sun Yat-Sen University) zhang.qing@yahoo.com

A local converse theorem for quasi-split unitary group

ABSTRACT: Let E/F be a quadratic extension of p-adic fields and let $U(2r+1)$ be the quasi-split unitary group of size $2r+1$ associated with E/F. In this talk, I will briefly explain a local converse theorem for $U(2r+1)$, i.e., two generic irreducible representations of $U(2r+1)$ are determined by their local gamma factors twisted by $GL_k(E)$ for $1 \leq k \leq r$.