

Timetable

	Sun	Mon	Tue	Wed	Thu	Fri
09:00-09:50		S. Kim	B. Kane	N. Otsubo	Y-L Kuan	discussion
10:10-11:00		K. Nakamura	K. Kim	J. Jang	J. Ha	
11:20-12:10		Y. Lee	S. Yamana	J. Haan	J. Fang	
12:10-14:00		Lunch	Lunch	Lunch	Lunch	
14:00-14:50		C-J Wang	C. Zhang	Excursion	K. Tasaka	
15:10-16:00		T. Hiranouchi	P-C Hung	Excursion	C-Y Chuang	
16:20-17:10		H. Yoo	Y. Hu	Excursion	J. Jung	
17:30-18:20	reception			Excursion		
18:30-		Dinner	Banquet	Dinner	Dinner	

Abstracts

Chih-Yun Chuang (national taiwan U.)

Title: Average values of ℓ -th moment of L-functions over non-square polynomials

Abstract: Let $k = \mathbb{F}_q(t)$ be a rational function field of odd characteristic p , $A = \mathbb{F}_q[t]$ a polynomial ring, and A^+ the set of all monic polynomials. Given a non-square $m \in A$, we investigate the L -function $L(s, \chi_m)$ associated with the quadratic symbol $\chi_m(n) := \left[\frac{m}{n} \right]$ for $n \in A$. Suppose that M is an odd positive integer and ℓ is a positive integer. We are interested in studying the asymptotic formula of $\sum_{m \in A^+ \atop \deg m = M} L^\ell(s, \chi_m)$. In this talk, we will discuss this and relating type of average values.

Jiangxue Fang (Capital Normal University)

Title : Equivariant L-values of Drinfeld modules

Abstract : In this talk, we will study the special value of the Artin L-function of Drinfeld modules twist by some Galois representation. For the convenient to group all L-value of Artin type, we study an equivariant L-value of Drinfeld modules of Galois extensions of function fields. To do this, we will construct the trace formula of L-functions of equivariant crystals and use the determinant calculations.

Junsoo Ha (KIAS)

Title : Smooth Polynomial solutions to $X+Y=Z$ over finite fields.

Abstract : We say an integer n is y -smooth if all of its prime factors are less than or equal to y . We consider the Diophantine equation $a+b=c$ where all variables are y -smooth and $\gcd(a,b,c)=1$. An interesting application of this equation is to construct many solutions to an S -unit equation $u+v=1$, when S is the set of first s primes. A recent work of Lagarias and Soundararajan showed that this equation has at least $\exp(s^{1/\kappa})$ solutions for $\kappa > 8$ when s is large. In this talk, I will describe some recent progress in this problem and an analogous theorem for the polynomial rings over finite fields

Toshiro Hiranouchi (Hiroshima U.)

Title: Class field theory for curves over local fields

Abstract: Although a large number of studies have been made on the class field theory for varieties over p -adic fields, little is known about coverings with wild ramification over a local field with positive characteristic. The aim of this talk is to investigate the idele class group for an open curve over a local field with arbitrary characteristic and decide the kernel and the cokernel of the reciprocity map.

Yong HU (University of Caen, France, yong.hu@unicaen.fr)

Title: The Pythagoras number of Laurent series fields in several variables

Abstract: The Pythagoras number $p(F)$ of a field F is the smallest integer $p \geq 1$ (or $+\infty$) such that every sum of (finitely many) squares in F can be written as a sum of at most p squares in F . In this talk, we will be mainly interested in the case where F is a Laurent series fields in several variables. We will explain how the computation of $p(F)$ can be reduced to the case of certain rational function fields. In particular, we will show the following result:

If k is an algebraic function field of transcendence degree $d \geq 0$ over

\mathbb{R} (resp. over \mathbb{Q}) and if $F = k((x,y,z))$ is a Laurent series field in three variables over k , then $\rho_p(F) \leq 2d+2$ (resp. $\rho_p(F) \leq 2d+3$).

Pin-Chi Hung

Title: On the derivative of anticyclotomic p -adic L -functions.

Abstract: I will report a work on the construction of anticyclotomic p -adic L -functions for Hilbert modular forms of finite slopes and a formula relating the first derivative of this p -adic L -function at the central point and Teitelbaum's L -invariant defined by Chida, Mok and Park. Our results extend previous works of Bertolini, Darmon, Iovita and Speissegger to Hilbert modular forms.

Junmyeong Jang (Ulsan Univ.)

title : A lifting of an automorphism of a K3 surface over odd characteristic

abstract : In this talk, we prove that, over an algebraically closed field of odd characteristic, an automorphism of a K3 surface of finite height can be lifted over the ring of Witt vectors of the base field if the order of its action on the crystalline transcendental lattice is prime to the characteristic. Moreover, we prove, for a weakly tame K3 surface of finite height, there is a lifting over the ring of Witt vectors to which all the automorphisms can be lifted. Also we prove that a non-symplectic tame automorphism of a supersingular K3 surface or a symplectic tame automorphism of a supersingular K3 surface of Artin-invariant at least 2 can be lifted over the ring of Witt vectors. Using these results, we prove a K3 surface equipped with a purely non-symplectic automorphism of a certain high order is unique up to isomorphism.

Junehyuk Jung (KAIST)

Title: Quantum Ergodicity and the number of nodal domains of Maass forms.

Abstract: In this talk I'll first go over some problems and related results in spectral geometry. Then I'll explain how one can apply Quantum Ergodicity and Bochner's theorem to prove that the number of nodal domains of quantum ergodic sequence of even eigenfunctions tends to infinity as the eigenvalue $\lambda \rightarrow +\infty$. In particular, this implies that the number of nodal domains of Maass-Hecke eigenforms grows with the eigenparameter. This talk is based on the joint works with S. Zelditch and with S. Jang.

B. Kane (Hongkong Univ.)

Title: Meromorphic modular forms and polar harmonic Maass forms

Abstract: In this talk, we will discuss applications of a new modular object known as polar harmonic Maass forms on some old questions of Petersson about meromorphic modular forms. These applications include an explicit version of the Riemann-Roch Theorem and Fourier coefficients for meromorphic modular forms.

Kwangseob Kim (KIAS)

Title : Construction of unramified extensions with a prescribed solvable Galois group

Abstract : We will prove that for any finite solvable group G , there exists a cyclic extension K/Q and a Galois extension M/Q such that the Galois group $\text{Gal}(M/K)$ is isomorphic to G and M/K is unramified. We will apply the theory of embedding problem of Galois extensions to this problem and gives a recursive procedure to construct such extensions.

Seungki Kim (KIAS)

Title : The shape of typical reduced bases

Abstract : The demand for understanding the shape of high-dimensional random lattices is recently growing, in part due to the advent of lattice cryptography. Yet there has been very few, if any, theoretical studies on this subject. I will present a joint work in progress with Akshay Venkatesh, which, by using the spectral theory of Eisenstein series, suggests what a typical LLL or Siegel reduced basis of a random lattice looks like. This result has an interesting implication on the behavior of the LLL lattice reduction algorithm.

Yen-Liang Kuan (National Taiwan U.)

Title : Criterion for deciding zeta-like multizeta values in positive characteristic

Abstract: In this talk, we shall give an effective algorithm for determining whether a given multizeta value is zeta-like, namely those whose ratio with the zeta value of the same weight is rational. On the other hand, we state conjectures on certain families of zeta-like multizeta values.

Yoonbok Lee (Incheon National University)

Title : Selberg's orthonormality conjecture and joint universality of L-functions.

Abstract :

We introduce a new approach how to use an orthonormality relation of coefficients of Dirichlet series defining given L-functions from the Selberg class to prove joint universality

Kentaro Nakamura

Title : Local epsilon-isomorphisms for rank two p-adic representations of $\text{Gal}(\bar{\mathbb{Q}}_p/\mathbb{Q}_p)$ and a functional equation of Kato's Euler system.

Abstract :

Noriyuki Otsubo (Chiba U.)

Title: CM regulators and hypergeometric functions

Abstract:

We study a certain class of fibrations of varieties over the projective line with complex multiplication by a number field. Their periods are written in terms of values of the gamma function and the conjecture of Gross-Deligne is verified. Their regulators are expressed in terms of generalized hypergeometric functions. As a result, we obtain the non-vanishing of the regulator in some cases. This is a joint work with Masanori Asakura.

Koji Tasaka(Postech, Korea)

Title: Multiple zeta values and periods of modular forms

Abstract: The multiple zeta values (abbreviated MZVs) are multivariate generalisations of the values of the Riemann zeta function at positive integers. These real number are known to be related with number theory, knot theory, quantum field theory, arithmetic geometry and so on. Our interest in the study of MZVs is a connection with the theory of elliptic modular forms (or their period polynomials), which was first discovered by Don Zagier and then investigated in depth by Gangl, Kaneko and Zagier in the case of depth 2.

In my talk, we will provide this connection for arbitrary depths through the study of linear relations among MZVs at the sequences indexed by odd integers greater than 1, modulo lower depth. This work is motivated by a certain dimension conjecture proposed by Francis Brown. We finally present an affirmative answer to his dimension conjecture in the case of depth 4.

Jaeho Haan (KAIST)

Title : The Bessel period of $U(3)$ and $U(2)$ involving a non-tempered representation

Abstract : In 2012, Neal Harris has given a refined Gross-Prasad conjecture for unitary group as an analogue of Ichino and Ikeda's paper "On the periods of automorphic forms on special orthogonal groups and the Gross-Prasad conjecture" concerning special orthogonal groups. In his paper, he stated a conjecture under the assumption that the pair of given representations should be tempered. In this

paper, we consider a specific pair involving a non-tempered one. In this case, an analogous formula still exists but the central critical L -value is slightly different with the one in the conjecture. As a corollary, this verifies that the Gross-Prasad conjecture cannot be extended to the non-tempered case at least in its current form.

Shunsuke Yamana (Kyushu U.)

Title: On the lifting of Hilbert cusp forms to holomorphic cusp forms on tube domains

Abstract: I will deal with the following problem: Starting from simple automorphic data such as elliptic cusp forms, construct more complicated automorphic forms on hermitian symmetric domains of higher degree. I will construct a lifting that associate to a Hilbert cusp form a cusp form on a quaternionic unitary groups. This is an analogue of the Hilbert-Siegel cuspidal Hecke eigenforms constructed by Tamotsu Ikeda.

Hwajong Yoo

Title : On Eisenstein ideals and the cuspidal group.

Abstract : In this talk, we discuss Eisenstein ideals of the Hecke ring of level N with N square-free. The main theorem of this talk is the following. "Every Eisenstein maximal ideal has support at the cuspidal group."

Chong Zhang (Beijing Normal University)

Title: On Guo-Jacquet conjecture

Abstract: Guo-Jacquet conjecture is a generalization of Waldspurger's result on central values of L -functions of $GL(2)$. I will report the recent progress on this conjecture.