2nd Kyoto conference on automorphic forms

Abstract of talks

June 14 (Fri.)

13:00 – 14:00 Atom Otsuka (Kyoto University)

Title: Saito-Kurokawa lifting over a totally real number field and Maass relation

Abstract: In this talk, we formulate a Maass relation and a Maass space in Hilbert modular case. If the class number one, it is shown that the Maass space is isomorphic to the space of Hilbert-Siegel modular forms generated by the Saito-Kurokawa lifting.

14:10 – 15:10 Kenji Koike (Yamanashi University)

Title: Jacobian Kummer surfaces of degree 8

Abstract: We give explicit equations of the fibration of Jacobian Kummer surfaces over the Siegel modular 3-fold of level (2,4). The total space is a smooth projective 5-fold which is regarded as a higher-dimensional analogue of Shioda's elliptic modular surfaces S(4).

15:20 – 16:20 Yumiko Hironaka (Waseda University)

Title: Spherical functions on the space of p-adic unitary hermitian matrices

Abstract: We investigate the space X of unitary hermitian matrices over $\mathfrak{p}$-adic fields through spherical functions, where we assume $\mathfrak{p}$ does not stand over 2. First we determine Cartan decomposition of X, define typical spherical functions on X, and give their explicit formulas. Then we parametrize all the spherical functions, and show the Schwartz space $\mathcal{S}(K\backslash X)$ is a free Hecke algebra $\mathcal{H}(G,K)$-module of rank 2^n, where $2n$ or $2n+1$ is the size of matrices in X, and give the explicit Plancherel formula on $\mathcal{S}(K\backslash X)$. This is joint work with Y.Komori.

16:30 – 17:30 Yoshinori Mizuno (Tokushima University)

Title: Kernel of twisted symmetric square of elliptic modular forms

Abstract: We construct a holomorphic kernel of twisted symmetric square of elliptic modular forms, which is useful to evaluate special values numerically. Some variant will also be discussed.

June 15 (Sat.)

9:30 – 10:30 Kazunari Sugiyama (Chiba Institute of Technology)

Title: Automorphic distributions and the converse theorem for Maass wave forms

Abstract: Firstly, following T. Suzuki (1979), we define Dirichlet series associated with automorphic distributions on $(GL(1), V(1))$, and prove their functional equations. Secondly, we explain that such automorphic distributions can be constructed from (the dual of) principal series representations that are invariant the action of an arithmetic subgroup. Such principal series representations correspond to Maass wave forms via the Poisson transform (or the boundary value map), and thus we can formulate a converse theorem for Maass wave forms. Finally, we construct Dirichlet series which satisfy the assumption of our converse theorem by using the zeta functions associated with a certain prehomogeneous vector space.

This is a joint work with Fumihiro Sato (Rikkyo University), Keita Tamura (Rikkyo University), Tadashi Miyazaki (Kitasato University), Takahiko Ueno (St. Marianna University School of Medicine).

10:45 – 11:45 Takuya Miyazaki (Keio University)

Title: A computation of the Bessel integrals for Sp(2,R)

Anstract: I will explain a procedure to transform the Bessel integrals for Sp(2,R) into integrals of Fourier-Jacobi type, which will be applied to understand the Fourier-Jacobi expansions of certain real analytic modular forms of degree 2.

13:30 – 14:30 Frank Thorne (University of South Carolina)

Title: Explicit Dirichlet Series for Fields With Given Resolvent

Abstract : Building on work of H. Cohen and his collaborators, we will describe a Kummer-theoretic approach to enumerating number fields. This leads to explicit formulas for the Dirichlet series counting cubic (or, more generally, degree l) fields with given quadratic resolvent, and for the series counting A_4 or S_4k fields with given resolvent. This is joint work with H. Cohen.

These approaches are related to zeta functions associated to prehomogeneous vector spaces; for example I will describe a proof that Shintani's zeta function cannot be written as a finite sum of Euler products. These series are also related to Nakagawa's "extra functional equation" for the Shintani zeta function, and we will describe how we might hope to generalize or extend Nakagawa's work, for example to the quartic case.

14:45 – 15:45 Andrew Booker (RIMS)

Title: Converse theorems, explicit formulae and the Selberg class.

Anstract: What is an L-function? In a celebrated paper, Selberg attempted to define them axiomatically, more or less by writing down the common properties of the known examples. However, it is not obvious which properties should be considered axioms and which theorems, and there is no general agreement on this point. I will discuss some general musings on interpreting the "converse theorems" of automorphic representation theory in terms of the "explicit formulae" of L-functions, with the ultimate goal of giving an axiomatic characterization that is less ad hoc and, hopefully, more useful.

16:00 –17:00 Masao Tsuzuki (Sophia University)

Title: An explicit relative trace formula for Hilbert modular forms and its applications

Anstract: This is joint work with Shingo Sugiyama. In this talk, we report our recent result on relative trace formula on PGL(2) computing the spectral averages for the central L-values of quadratic base change of holomorphic Hilbert mudular forms. We explicitly calculate all local terms of the trace formula, dropping several assumptions which have always been assumed in existing works of similar theme. The following applications of our explicit relative trace formula will be explained: (i) a spectral equidistribution result in the leve aspect for the Satake parameters weighted by central L-values; (ii) a subconvexity bound of quadratic base change L-functions for holomorphic Hilbert cusp forms in the weight aspect; (iii) Existence of infinitely many holomorphic Hilbert cusp forms with arbitrarily large field of definition and with non vanishing central L -values.

June 16 (Sun.)

9:30 – 10:30 Tadahisa Nara

Title: On lower bounds of the canonical height on elliptic curves

Abstract: Silverman showed that for every elliptic curve over a number field there exists a positive lower bound of the canonical height. Also there is an algorithm which gives a positive lower bound for a given elliptic curve. In this talk, I give a uniform lower bound of the canonical height for a family of quadratic twists of an elliptic curve over Q. This result can be used to consider the problem of whether certain rational points can be a part of a basis of the Mordell-Weil group. I also talk about such an application of the result.

10:45 – 11:45 Sho Takemori (Kyoto University)

Title: Λ-adic Siegel-Eisenstein series of degree n

Abstract: Let F be a totally real field and χ a Hecke character of F modulo a power of prime ideal. We introduce a formula for the Fourier coefficients of Siegel Eisenstein series of degree n and character χ, if the conductor of χ is relatively prime to 2 and χ^2 is ramified. We also introduce that there exits a Λ-adic Siegel Eisenstein series of degree n.