Fukuoka International Conference on Arithmetic Geometry 2017

Date April 17 (Mon) – 21 (Fri), 2017
Place Nishijin Plaza, Fukuoka, JAPAN
Main Conference Room A
Organizer Shinichi Kobayashi (Kyushu University), Nobuo Tsuzuki (Tohoku University)

This conference is supported by JSPS, Program for Advancing Strategic International Networks to Accelerate the Circulation of Talented Researchers.

Program

April 17 (Mon)

9:00 – 10:00 Registration/Opening

10:00 – 11:00 Atsushi Shiho (Tokyo University)
Comparison of relatively unipotent log de Rham fundamental groups

11:15 – 12:15 Tomoki Mihara (Tokyo Insititute of Technology)
On Schikhof Dual of p-adic Formal Groups

14:30 – 15:30 Ming-Lun Hsieh (Academia Sinica)
p-adic L-functions for triple product and applications

16: 00 – 17:00 Shinichi Kobayashi (Kyushu University)
The p-adic Gross-Zagier formula for higher weight modular forms at non-ordinary primes

17:00 – 18:00 Free discussion

April 18 (Tue)

10:00 – 11:00 Masanobu Kaneko (Kyushu University)
Finite multiple zeta values

11:15 – 12:15 Shuji Yamamoto (Keio University)
Kawashima functions and multiple zeta values

14:30 – 15:30 Shun Ohkubo (Nagoya University)
On the rationality of the logarithmic growth filtration of solutions of p-adic differential equations

16:00 – 17:00 Jeng-Daw Yu (National Taiwan University)
Recent developments in irregular Hodge filtrations

17:00 – 18:00 Free discussion

April 19 (Wed)

9:30 – 10:30 Tomoyuki Abe (IPMU)
Existence of crystalline companion and l-adic companion

10:45 – 11:45 Bruno Chiarellotto (Padova University)
ℓ-independence over local function fields

14:00 – 18:00 Free discussion

April 20 (Thu)

10:00 – 11:00 Takeshi Saito (Tokyo University)
Characteristic cycle of an l-adic sheaf

11:15 – 12:15 Andreas Langer (Exeter University)
p-adic deformation of motivic Chow groups

14:30 – 15:30 Shusuke Otabe (Tohoku University)
On a purely inseparable analogue of the Abhyankar conjecture for affine curves

16:00 – 17:00 Masataka Chida (Tohoku University)
Chow-Heenger cycles on products of CM elliptic curves.

17:00 – 18:00 Free discussion

April 21 (Fri)

10:00 – 11:00 Kazuki Yamada (Keio University)
Category of mixed plectic Hodge structures

11:15 – 12:15 Jan Nekovář (Paris 6 University)
Some remarks on arithmetic local constants

14:30 – 15:30 Shin Hattori (Kyushu University)
Irreducible components of the eigencurve of finite degree are finite over the weight space

16:00 – 17:00 Nobuo Tsuzuki (Tohoku University)
On constancy of Newton polygons of F-isocrystals on Abelian varieties

17:00 – 18:00 Free discussion

Title and abstract

Speaker: Tomoyuki Abe
Title: Existence of crystalline companion and l-adic companion
Abstract: We will show that there exists a correspondence between smooth l-adic sheaves and overconvergent F-isocrystals over a curve preserving the Frobenius eigenvalues. Moreover, we show the existence of l-adic companions associated to overconvergent F-isocrystals for smooth varieties. Some part of the work is done jointly with Esnault.

Speaker: Bruno Chiarellotto
Title:ℓ-independence over local function fields
Abstract: We study various forms of ℓ-independence (including $\ell = p$) for the cohomology and fundamental groups of varieties on equicharacteristic local fields. Joint work with C. Lazda.

Speaker: Masataka Chida
Title: Chow-Heenger cycles on products of CM elliptic curves
Abstract: Bertolini-Darmon-Prasanna introduced a construction of rational points on CM elliptic curves assuming Tate conjecture for (generalized) Kuga-Sato varieties. In this talk, we will extend their construction to the case of self products of CM elliptic curves. Moreover we will obtain a relation between the p-adic Abel-Jacobi image of the cycles and the special values of (p-adic) L-functions generalizing their works.

Speaker: Shin Hattori
Title: Irreducible components of the eigencurve of finite degree are finite over the weight space
Abstract: Let p be a rational prime and N a positive integer prime to p. The Coleman-Mazur eigencurve C_N is a rigid analytic curve over $\mathbb{Q}_p$ which p-adically interpolates the set of classical elliptic eigenforms of finite slope and tame level N. In this talk, I will explain a joint work with James Newton in which we show that any irreducible component of C_N of finite degree over the weight space W is actually finite over W. By a theorem of Chenevier, our theorem plus a conjecture on slopes near the boundary of W (due to Coleman-Mazur, Buzzard-Kilford) implies that any such component should be in the ordinary locus.

Speaker: Ming-Lun Hsieh
Title: p-adic L-functions for triple product and applications
Abstract: In this talk, we present a construction of p-adic triple product L-functions for Hida families with explicit interpolation formulae. Arithmetic applications to anticyclotomic p-adic L-functions for modular forms will be discussed

Speaker: Masanobu Kaneko
Title: Finite multiple zeta values
Abstract: We discuss two very different "finite" versions of the classical multiple zeta values. After giving some basics, we present a conjectural isomorphism of the two rings of finite multiple zeta values and give some results which support our conjecture. This is a joint work with Don Zagier.

Speaker: Shinichi Kobayashi
Title: The p-adic Gross-Zagier formula for higher weight modular forms at non-ordinary primes
Abstract: We explain the higher weight generalization of the p-adic Gross-Zagier formula for elliptic curves at non-ordinary primes obtained by the speaker before. It is also the non-ordinary generalization of the same formula obtained by J. Nekovář at ordinary primes.

Speaker: Andreas Langer
Title: p-adic deformation of motivic Chow groups
Abstract: For a smooth projective scheme Y over $W(k)$ we consider an element in the motivic Chow group of the reduction Y_m over the truncated Witt ring $W_m(k)$ and give a "Hodge" criterion using the crystalline cycle class in relative crystalline cohomology for the element to the lift to the continuous Chow group of Y. The result extends previous work of Bloch-Esnault-Kerz on the p-adic variational Hodge conjecture to a relative setting. In the course of the proof we derive two new results on the relative de Rham-Witt complex and its Nygaard filtration, and work with relative syntomic complexes to define relative motivic complexes for a smooth, formal lifting of Y_m over $W(W_m(k))$.

Speaker: Tomoki Mihara
Title: On Schikhof Dual of p-adic Formal Groups
Abstract: I introduce dualities between profinite Abelian groups and certain Abelian formal groups and between discrete groups and certain analytic groups over local fields as non-Archimedean analogues of Pontryagin duality. Extending the dualities, I study Schikhof duality between Hopf monoids in symmetric monoidal categories of linear compact flat modules and of Banach spaces. For example, every formal group forms a Hopf mponoid in the former symmetric monoidal category, and its representation, which is a comodule by definition, is presented as a module over the dual Hopf monoid. The dual presentation gives analogues of highest weight theory and the construction of irreducible representations using Groebner bases, and hence is useful to construct a universal p-adic family interpolating irrefucible representations. As an application, a p-adic family of Galois representations associated to elliptic modular forms appears in the etale cohomology of the sheaf on a modular curve associated to the universal p-adic family for SL_2. Moreover, Schikhof dual of quantum groups obtained as deformations of formal groups admit good presentations, and is helpful to study their representations.

Speaker: Jan Nekovář

Title: Some remarks on arithmetic local constants
Abstract: We are going to discuss several compatibility results between arithmetic local constants of Mazur and Rubin and the usual local epsilon constants. These results have applications in a global setting.

Speaker: Shusuke Otabe
Title: On a purely inseparable analogue of the Abhyankar conjecture for affine curves
Abstract: Let U be an affine smooth curve defined over an algebraically closed field of positive characteristic. The Abhyankar conjecture (proved by Raynaud and Harbater in 1994) describes the set of finite quotients of Grothendieck's étale fundamental group $\pi_1^{\text{ét}}(U)$. In this talk, I will consider a purely inseparable analogue of this problem, formulated in terms of Nori's profinite fundamental group scheme $\pi^N(U)$. I will state a conjectual description of all the infinitesimal quotients of $\pi^N(U)$ and give several evidences of it.

Speaker: Shun Ohkubo
Title: On the rationality of the logarithmic growth filtration of solutions of p-adic differential equations
Abstract: In his study of p-adic differential equations, B.Dwork proved that the power series solutions of certain p-adic differential equations such as (p-adic) Gaussian hypergeometric one satisfy a mild growth condition. Recently, B.Chiarellotto and N.Tsuzuki reconsidered Dwork's work and conjectured a relationship between the order of growth and Frobenius slopes of the space of solutions. In this talk, we discuss some part of Chiarellotto-Tsuzuki conjecture.

Speaker: Takeshi Saito
Title: Characteristic cycle of an l-adic sheaf
Abstract: For an l-adic sheaf on a smooth variety over a perfect field, its characteristic cycle is defined as a $\mathbb{Z}$-linear combination of irreducible components of the singular support, defined by Beilinson as a closed conical subset of the cotangent bundle. It gives an analogue of that defined by Kashiwara-Schapira in a transcendental setting. We discuss its properties, including a recent progress on the compatibility with proper direct image.

Speaker: Atsushi Shiho
Title: Comparison of relatively unipotent log de Rham fundamental groups
Abstract: We prove the compatibilities of various definitions of relatively unipotent log de Rham fundamental groups for certain proper log smooth integral morphisms of fine log schemes of characteristic zero. Our proofs are purely algebraic. As an application, we give a purely algebraic calculation of the monodromy action on the unipotent log de Rham fundamental group of log curves, which enables us to give a purely algebraic proof of the p-adic good reduction criterion for proper hyperbolic curves due to Andreatta-Iovita-Kim. This is a joint work with Bruno Chiarellotto and Valentina Di Proietto.

Speaker: Nobuo Tsuzuki
Title: On constancy of Newton polygons of F-isocrystals on Abelian varieties
Abstract: In this talk we study variation of Newton polygons of F-isocrystals and prove the constancy of them on Abelian varieties. We also discuss the isotriviality of families of curves.

Speaker: Kazuki Yamada
Title: Category of mixed plectic Hodge structures
Abstract: Let $\mathscr{G}$ be the tannakian fundamental group of the category of mixed Hodge structures, and fix a positive integer g. In this talk, we will characterize a representation of $\mathscr{G}^g$ in terms of a weight filtration and g partial Hodge filtrations. According to the plectic conjecture of Nekovar and Scholl, such objects would appear in the Hodge realization of motives with real multiplication. This is joint work with Kenichi Bannai, Kei Hagihara, Shinichi Kobayashi, Shuji Yamamoto, and Seidai Yasuda.

Speaker: Shuji Yamamoto
Title: Kawashima functions and multiple zeta values
Abstract: The Kawashima functions, which are introduced and applied to the study of multiple zeta values by Gaku Kawashima, can be viewed as 'multiplification' of the digamma function. In this talk, I show how some analytic formulas on the digamma function are generalized to the Kawashima functions, and how they can be used to obtain algebraic relations among multiple zeta values. If time permits, I also present some unsolved questions.

Speaker: Jeng-Daw Yu
Title: Recent developments in irregular Hodge filtrations
Abstract: The existence of a Hodge type filtration on certain connections with irregular singularities was suggested by the considerations of Landau-Ginzburg models in mirror symmetry and the analogies with wild ramifications in étale sheaves in positive characteristic. In this talk, we report some recent results on the constructions of the irregular Hodge filtrations and focus on the structures of the resulting objects over a low dimensional base, e.g., the tensor product structure when the base is a point. Based on collaborations with Claude Sabbah.