Monday:
9:00 Registration

9:30 Andre: Periods of relative 1-motives

10:30 Coffee

11:00 M. Kerr: Apery extensions

In an important series of papers, Galkin, Golyshev, and Iritani have introduced the concept of Apery constants of Fano varieties, arising from asymptotics of solutions to their (A-model, irregular) quantum differential equations. In this talk, we propose and give examples of a (B-model, regular) interpretation of these constants in terms of limits of normal functions arising from motivic cohomology classes on the mirror family of Calabi-Yau varieties.

12:00 Lunch

13:45 S. Unver: Infinitesimal Chow Dilogarithm

Let C_2 be a smooth and projective curve over the ring of dual numbers of a field k. Given non-zero rational functions f, g, and h on C_2, I will construct an invariant $\rho(f \wedge g \wedge h) \in k$. This will be an analog of the real analytic Chow dilogarithm and the extension to non-linear cycles of the additive dilogarithm. Using this construction, I will state and sketch a proof of an infinitesimal version of the strong reciprocity conjecture of Goncharov. Also using ρ, I will define an infinitesimal regulator on algebraic cycles of weight two which generalizes Park's construction in the case of cycles with modulus.

15:00 D. Rudenko: Zagier's Polylogarithm Conjecture in Weight 4

16:00 Tea

16:30 R. Hain: Modular inverters

This is a report on a project that is joint with Francis Brown. A modular inverter is a genus 1 analogue of an associator. There is a canonical inverter that comes from the KZB connection. Its coefficients are multiple zeta values. In this talk I will define modular inverters, describe the conditions satisfied by them, and give a formula for the KZB-inverter in terms of iterated integrals of Eisenstein series. I will also explain how every associator should determine an inverter. If it does not, then the inverter condition imposes additional non-trivial conditions on associators. In this context, I will explain the connection with Enriquez's work on elliptic associators. If time permits, I will also indicate how associators and inverters determine the periods of the unipotent completion of higher genus generalizations of the Tate curve.

Tuesday

9:30 J. Ayoub: The conservativity conjecture for Chow motives in characteristic zero

10:30 Coffee

11:00 M. Levine: Chow-Witt groups, ramification and quadratic forms

Replacing the Chow groups with the Barge-Morel-Fasel Chow-Witt groups enables refining many classical constructions involving algebraic cycles to yield algebraic cycles with ``coefficients in quadratic forms''. When defined, the appropriate trace map refines a classical numerical invariant to an invariant in the Grothendieck-Witt group. I will detail some applications of this theory to aspects of ramification theory, drawing a parallel to Morse theory, and refining some classical formulas, such as the Riemann-Hurwitz formula, to give relations in the Grothendieck-Witt group.

12:00 Lunch

13:45 A. Huber-Klawitter: Nori's diagram category revisited

(jt. work with Luca Barbieri-Viale, Mike Prest) Nori defined an abelian category of mixed motives, universal for all cohomology theories comparable to singular cohomology. This approach is particularly well-suited for questions on period numbers and the period conjecture.

Nori's construction relies on two main ingredients:
- an abstract construction of an abelian category relative to a representation of a quiver
- the basic lemma, which guarantees the existence of a skeletal filtration by algebraic subvarieties
The subtle interplay between the two is needed in order to define the tensor structure.

Meanwhile, there have been alternative approaches to the construction of the abelian category using either mathematical logic or abstract category theory. We want to explain the latter, with particular emphasis on the tensor structure and the use of the basic lemma.

15:00 Burgos: Arithmetic intersection of Bloch higher cycles

(Joint work with Souvik Goswami.) We give a new definition of higher arithmetic Chow groups for smooth projective varieties defined over a number field, which is similar to Gillet and Soulé's definition of arithmetic Chow groups. We also give a compact description of the intersection theory of such groups. A consequence of this theory is the definition of a height pairing between two higher algebraic cycles, of complementary dimensions, whose real regulator class is zero. This description agrees with Beilinson's height pairing for

the classical arithmetic Chow groups. We also give examples of the higher arithmetic intersection pairing in dimension zero that, assuming a conjecture by Milnor on the independence of the values of the dilogarithm, are non-zero.

16:00 Tea

16:30 Terasoma: Period integrals of open Fermat surfaces and special values of hypergeometric functions

With Asakura and Otsubo, we prove that the special values of the hypergeometric function at one can be expressed as a linear combination of log of algebraic numbers over algebraic numbers, provided that the exponents satisfy a certain condition. This condition is related to Hodge cycles of Fermat surfaces.
In this talk, we give an explicit formula for these special values using explicit algebraic cycles given by Aoki-Shioda. (arXiv:1801.01251)

Wednesday

9:30 Furusho: A Betti counterpart of the harmonic coproduct (I)

In earlier work, we proved that Racinet's double shuffle group is the stabilizer of the harmonic coproduct defined on a subalgebra of the free algebra over two generators relative to a certain action on this algebra. This leads to the construction of a family of new coproducts on the same algebra, depending on a scalar parameter, which are related with one another by scaling transformations. The double shuffle torsor can then be described as the set of elements taking the harmonic coproduct to the new coproduct. We compute the new coproduct in terms of an explicit coproduct of a suitable subalgebra of the algebraof the free group with two generators. The proof relies on an interpretation of the harmonic coproduct in terms of infinitesimal braid Lie algebras, which is implicit in the unpublished work of Deligne and Terasoma from 2005.

10:30 Coffee

11:00 Enriquez: A Betti counterpart of the harmonic coproduct (II) (see above)

12:00 Lunch

13:45 Michael Hoffman: Multiple zeta values and alternating MZVs arising from a combinatorial problem

Guy Louchard posed the problem of obtaining the general term of an asymptotic expansion of a certain definite integral. This led several people, including myself, to look for formulas. There is one

involving alternating multiple zeta values and Euler polynomials. Somewhat surprisingly, it reduces to a rational polynomial in the ordinary zeta values. It also suggests a set of relations among alternating multiple zeta values.

15:00 Charlton: Motivic MZV's and the cyclic insertion conjecture

16:00 Tea

16:30 Sato: Charlton's conjecture on multiple zeta values

In this talk, we give a proof of the generalized cyclic insertion conjecture on MZVs, which was formulated by Steven Charlton in his thesis. The conjecture is stated in terms of the block notation for MZVs introduced by himself. Charlton’s conjecture is a broad generalization of several long unproven families of identities such as Borwein–Bradley– Broadhurst–Lisonek’s cyclic insertion conjecture and certain conjectural identities posed by Hoffman. Our proof is based on certain identities among iterated integrals on a punctured projective line which we found by a search with the aid of computers. This is a joint work with Minoru Hirose at Kyushu University.

Thursday

9:30 Scholl/Nekovar: Plectic cohomology

10:30 Coffee

11:00 Lemma: Algebraic cycles and residues of degree eight L-functions of GSp(4)xGL(2)

I will present results inspired by the conjectures of Tate and Beilinson relating some algebraic cycles to non-critical special values of motivic L-functions, in the case of residues of degree eight L-functions of some cuspidal automorphic representations of GSp(4)xGL(2). The main ingredient in the proof of these results is to compute the residue as an integral of a differential form over a cycle in the Shimura variety of GSp(4)xGL(2).

12:00 Lunch

13:45 Lichtenbaum: Cohomological description of special values of zeta functions

We will describe conjectured formulas for the leading terms of Laurent series expansions of zeta-functions of regular schemes projective over Spec Z around integer points. These formulas will involve the orders of torsion subgroups of finitely generated cohomology groups and determinants of maps between finitely generated cohomology groups, (after tensoring with the complex numbers) such as period maps, regulators, and height pairings. The cohomology theories involved will be Betti, de Rham and Weil-etale motivic.

15:00 Flach: Higher class number formulas

We report on joint work with B. Morin, Bordeaux, in which we give a conjectural description of the vanishing order and leading Taylor coefficient of the Zeta function of a proper regular arithmetic scheme at any integer argument. This description generalizes ideas of Lichtenbaum on Weil-etale cohomology and is compatible with the Tamagawa number conjecture of Bloch, Kato, Fontaine and Perrin-Riou. For the Dedekind Zeta function of a number field F at an integer argument, it amounts to a formula reminiscent of the analytic class number formula. It is completely proven if F is absolutely abelian. Time permitting, we make some remarks about the additive term in this formula.

16:00 Tea

16:30 Dummigan: Automorphic forms on Feit's Hermitian lattices (joint work with Sebastian Schoennenbeck). Feit showed, in 1978, that the genus of unimodular hermitian lattices of rank 12 over the Eisenstein integers contains precisely 20 classes. Complex-valued functions on this finite set are automorphic forms for a unitary group. Using Kneser neighbours, we find a basis of Hecke eigenforms, for each of which we propose a global Arthur parameter. This is consistent with several kinds of congruences involving classical modular forms and critical L-values, and also produces some new examples of Eisenstein congruences for U(2,2).

Friday

9:30 Cao: Motives for an elliptic curve

In this talk, we briefly review the general theory of commutative differential algebras over a reductive group. Then we apply the theory of cdgas to study motives for an elliptic curve extending the known results for mixed Tate motives.

10:30 Coffee

11:00 Zhu: The Galois group of the category of mixed Hodge-Tate structures

The category of mixed Hodge-Tate structures over Q is a mixed Tate category of homological dimension one. By Tannakian formalism, it is equivalent to the category of graded comodules of a commutative graded Hopf algebra. In my recent joint work with A. Goncharov, we give a canonical description A (C) of the Hopf algebra. Such construction can be generalized to A (R) for any dg-algebra R with a Tate line.

12:00 Lunch

13:45 Matthes: Elliptic analogs of multiple zeta values

Following fundamental work of Enriquez and of Brown--Levin, we introduce an elliptic analog of the classical multiple zeta values. These elliptic multiple zeta values are a family of periods parametrized by the upper half-plane which are obtained from the monodromy of the Knizhnik--Zamolodchikov--Bernard connection on once-punctured complex elliptic curves. Using results of Enriquez, we will see how the structure of the Q-algebra generated by the elliptic multiple zeta values is governed by a certain Lie algebra of motivic origin. Our main result (joint with P. Lochak and L. Schneps) can be seen as a first step towards an elliptic analog of a theorem of Brown concerning the structure of the Q-algebra of (motivic) multiple zeta values.

15:00 Hirose: Confluence relations of multiple zeta values

In this talk, we consider iterated integrals on a projective line minus generic four points and introduce a new class of linear relations among MZVs, which we call confluence relations. We start with Goncharov's notation for iterated integrals, review some basic notions and properties of iterated integrals, and define a class of relations among iterated integrals, which naturally arise as "solving differential equations step by step". Confluence relations are defined as the limit of these relations when merging two out of the four punctured points. One of the significance of the confluence relations is that it is a rich family and seems to exhaust all the linear relations among the MZVs. As a good reason for this, we show that confluence relations imply the extended double shuffle relations as well as the duality relations. This is a joint work with Nobuo Sato at National Taiwan University.

16:00 Tea/Farewell