Workshop on Multiple Zeta Values

Organizer : Masanobu Kaneko (Kyushu University)

Dates: August 22 (Fri.) — 23 (Sat.)

Place: Kyushu University, Ito Campus, Faculty of Mathematics, Lecture room 1

Program

August 22 (Fri.)

10 : 30 – 11 : 30 Francis Brown (IHES)
Dinner parties, and irrationality proofs for zeta values

11 : 40 – 12 : 40 Yasuo Ohno (Tohoku Univ.)
Multiple zeta values and hypergeometric functions

14 : 10 – 15 : 10 Mike Hoffman (U.S. Naval Academy)
Some Prehistory of Finite Multiple Zeta Values

15 : 20 – 16 : 20 Masanobu Kaneko (Kyushu Univ.)
Finite multiple zeta values

16 : 30 – 17 : 30 Seidai Yasuda (Osaka Univ.)
p-adic multiple zeta values and truncated multiple harmonic sums

August 23 (Sat.)

10 : 00 – 11 : 00 Tatsushi Tanaka (Kyoto Sangyo Univ.)
Kawashima's relation: introduction and progress

11 : 10 – 12 : 10 Shuji Yamamoto (Keio Univ.)
Multiple integrals associated with 2-labeled posets

13 : 40 – 14 : 40 Francis Brown (IHES)
Single valued multiple zeta values

14 : 50 – 15 : 50 Kentaro Ihara (Osaka Univ.)
On multiple modular L-values

16 : 00 – 17 : 00 Tomohide Terasoma (Tokyo Univ.)
A filtration arising from representation of Tate curve

Abstracts :

Brown: Dinner parties, and irrationality proofs for zeta values.

This will be an overview of irrationality proofs for zeta values. After explaining Beuker's elementary approach to Apery's famous proofs of the irrationality of $\zeta(2)$ and $\zeta(3)$, I will present a simple and canonical geometric construction which exactly reproduces Apery's approximations, and many, if not all, known irrationality proofs for values of the Riemann zeta function. In particular, it contains the linear forms in Rivoal and Ball-Rivoal's proof that infinitely many odd zeta values are irrational. Underlying this construction is an intricate algebraic structure which remains to be explored.

Ohno: Multiple zeta values and hypergeometric functions

Some of known relations among multiple zeta values are obtained by their relationship with hypergeometric functions. I am planing to talk about the history and recent computation of this direction.

Hoffman: Some Prehistory of Finite Multiple Zeta Values

The recent burst of activity on multiple zeta values actually has a prehistory going back almost 20 years. My own work in this area began in the early 1990's, and began to look more promising about 10 years later with the introduction of ideas from algebra. I will talk about some of the motivation and results of this early work, and how it has been completed in an essential way by recent results of Kh. Hessami Pilehrood, T. Hessami Pilehrood, and R. Tauraso.

Kaneko: Finite multiple zeta values

Starting from the naive truncation and mod p of the usual multiple zeta values, we define "finite multiple zeta values" as elements in an algebra over the rationals. We give some results and conjectures on these finite multiple zeta values as well as their real analogues, which strongly suggest that the finite multiple zeta value is something motivic. This is a joint work with Don Zagier.

Yasuda: p-adic multiple zeta values and truncated multiple harmonic sums

I will propose a conjecture on integrality of the p-adic multiple zeta values introduced by Furusho, and will give a conjectural formula which gives a relation between the p-adic multiple zeta values introduced by Deligne and truncated multiple harmonic sums. Some part of the material of this talk is based on my joint work with Minoru Hirose.

Tanaka: Kawashima's relation: introduction and progress

Kawashima's relation for multiple zeta values was proved by Dr. G.Kawashima in around 2007.

It is thought that the relation is enough to give the upper bound of dimension of the MZV space. (Hence it is thought to be equivalent to regularized double shuffle relation or associator relation.) Several applications have been discovered so far. We introduce Kawashima's relation and summarize several related results and conjectures.

Yamamoto: Multiple integrals associated with 2-labeled posets

We introduce a class of multiple integrals associated with certain combinatorial data (which we call 2-labeled posets), and discuss some elementary properties and applications. It is a generalization of the well-known iterated integrals for multiple zeta values of Euler-Zagier type, and also includes some other kinds of multiple zeta values (multiple zeta-star values, Arakawa-Kaneko type and Mordell-Tornheim type).

Brown: Single valued multiple zeta values

Ihara: On multiple modular L-values

We introduce multiple modular L-functions associated to elliptic cusp forms and their expressions in terms of iterated integral of cusp forms. Such integrals were first discussed by Y.I. Manin around 2004. We will look at relations among multiple L-values as an analogy of those among multiple zeta values.

Terasoma: A filtration arising from representation of Tate curve