Multiple zeta values and related topics [*]

Date: June 10 (Mon) 14:20 – June 12 (Wed) 17:00, 2019
Venue: June 10, 11 : IMI Auditorium, D-413, West Zone 1, Ito Campus, Kyushu University
               June 12 : IMI Conference Room, D-414, West Zone 1, Ito Campus, Kyushu University
Organizers: Minoru Hirose (Kyushu University), Masataka Ono (Kyushu University)
               Tomokazu Onozuka (Kyushu University), Nobuo Sato (Kyushu University)

Program

June 10, Monday

14:20–14:30   Opening

14:30–15:30   Yasuo Ohno (Tohoku Univ.)
    Title: On Arakawa-Kaneko type zeta functions and poly-Bernoulli numbers

16:00–17:00   Kenji Sakugawa (RIMS)
    Title: On mixed elliptic smooth $\mathbb{Q}_p$-sheaves over modular curves (in progress)

June 11, Tuesday

10:00–11:00   Masanobu Kaneko (Kyushu Univ.)
    Title: On a variant of multiple zeta values of level two

11:30–12:30   Michael Hoffman (U.S. Naval Academy)
    Title: Quasi-Shuffle Algebras and the Interpolated Product
    ———Lunch Break———

14:30–15:30   Jianqiang Zhao (Eckerd College)
    Title: Variations of Finite Mordell-Tornheim Zeta Values

16:00–17:00   Hidekazu Furusho (Nagoya Univ.)
    Title: On a relation of Hirose and Sato

18:00–   Banquet

June 12, Wednesday

10:00–11:00   Shin-ichiro Seki (Tohoku Univ.)
    Title: On Dualities

11:30–12:30   Shuji Yamamoto (Keio Univ.)
    Title: Proofs of Hoffman's and Zhao's dualities via connected sums
    ———Lunch Break———

14:30–15:30   Henrik Bachmann (Nagoya Univ.)
    Title: Sum formulas for Schur multiple zeta values

16:00–17:00   Seidai Yasuda (Osaka Univ.)
    Title: Depth graded structures

Abstracts

Henrik Bachmann (Nagoya Univ.)
"Sum formulas for Schur multiple zeta values"

Abstract: In this talk, we discuss sum formulas for Schur multiple zeta values. Schur multiple zeta values were introduced by Yamasaki in 2010 and they assign to a Young tableau a real number. In the case of Young tableaux given by just a column or a row, these values specialize to multiple zeta and multiple zeta-star values respectively. For these, there are several results on sum formulas of different types. After introducing the notion of Schur multiple zeta values we will present results on Sum formulas for different types of Young tableaux and in particular, prove an even sum formula for all shapes. This talk is based on joint work with S. Kadota, Y. Suzuki, S. Yamamoto, and Y. Yamasaki.

Hidekazu Furusho (Nagoya Univ.)
"On a relation of Hirose and Sato"

Abstract: I will talk about the confluence relation which was introduced by Hirose and Sato. I will show that it is equivalent to Drinfeld's associator relation.

Michael Hoffman (U.S. Naval Academy)
"Quasi-Shuffle Algebras and the Interpolated Product"

Abstract: In 2000 I defined quasi-shuffle algebras to provide an algebraic framework for multiple zeta values (MZVs) and related quantities. This construction was generalized in my joint work with K. Ihara, published in 2017. I will talk about how S. Yamamoto's interpolated MZVs can be extended to the context of quasi-shuffle algebras, and how this extends results originally proved for MZVs to a much wider range of objects.

Masanobu Kaneko (Kyushu Univ.)
" On a variant of multiple zeta values of level two"

Abstract: We introduce and discuss a variant of multiple zeta values of level 2, which forms a subspace of the space of alternating multiple zeta values (Euler sums). Our variant is regarded as a "shuffle counterpart" of Hoffman's "odd variant". We show that our variant possesses several properties similar to the ordinary multiple zeta value such as duality, shuffle product, parity result, and certain sum formulas. We also discuss some conjectures on relations between our values and ordinary multiple zeta values. This is a joint work with H. Tsumura.

Yasuo Ohno (Tohoku Univ.)
"On Arakawa-Kaneko type zeta functions and poly-Bernoulli numbers"

Abstract: Twenty years ago, the original Arakwa-Kaneko zeta function was defined. Kaneko-Tsumura zeta function was defined, recently, as a twin sibling of the function. I plan to talk about some of my joint work with N. Kawasaki, Y. Sasaki and H. Wayama, including certain formulas of their special values, i.e. poly-Bernoulli numbers, and a kind of interpolation of the functions.

Kenji Sakugawa (RIMS)
"On mixed elliptic smooth $\mathbb{Q}_p$-sheaves over modular curves (in progress)"

Abstract: Let p be a prime number. In this talk, I will explain a relation between the category of mixed

elliptic smooth $\mathbb{Q}_p$-sheaves over the modular curve $\mathcal{M}_{1,1}$ and the category of mixed Tate motives over $\mathbb{Z}$. Then, I will give a partial result about a structure of second extension groups of that category.

Shin-ichiro Seki (Tohoku Univ.)
"On Dualities"

Abstract: This talk consists of two parts. The first is concerned with the duality for multiple zeta values. The duality was conjectured by Professor Hoffman and was proved by making change of variables in the iterated integral representation of the multiple zeta values. Recently, the speaker and Shuji Yamamoto found a new proof of the duality without using iterated integrals. The speaker will introduce the new proof using the connected sum. The second is concerned with so-called the Hoffman duality for $\mathcal{A}_1$-finite multiple zeta-star values. The Hoffman duality was proved by Professor Hoffman and generalized to the duality for $\mathcal{A}_2$-finite multiple zeta-star values by Professor Zhao. A few years ago, the speaker generalized to these dualities to $\widehat{\mathcal{A}}$-finite multiple zeta-star values. The speaker will give the formula and its simple proof.

Shuji Yamamoto (Keio Univ.)
"Proofs of Hoffman's and Zhao's dualities via connected sums"

Abstract: I give proofs of Hoffman's duality and Zhao's binomial identity on finite multiple harmonic sums, stressing their similarity. In fact, these proofs use the common idea, namely, the connected sums and their transport relations. This talk is based in part on a joint work with Shin-ichiro Seki.

Seidai Yasuda (Osaka Univ.)
"Depth graded structures"

Abstract: TBA.

Jianqiang Zhao (Eckerd College)
"Variations of Finite Mordell-Tornheim Zeta Values"

Abstract: In this talk, I will give a general survey on the recent progress in the study of finite Mordell-Tornheim zeta values and some variations related to these values. They are essentially some congruences of partial sums of the Mordell-Tornheim zeta value series truncated at primes. Classically, Zhou and Bradley showed that all Mordell-Tornheim zeta values can be expressed as rational linear combinations of multiple zeta values. This principle can be easily extended to the finite setting. However, by using some examples we show that the situation is more complicated in the study of supercongruence involving this type of sums.