UTokyo − OIST Joint Symposium of Knot theory

Date: Sep.11 (Monday)

Venue: Graduate School of Mathematical Sciences, University of Tokyo.   Room123.

Schedule: 13:00-17:30, (each talk is 40min).

Talkers: Yuanyuan Bao (Univ. Tokyo), Dror Bar-Natan (Toronto Univ.),

Mai Katada (Univ. Tokyo), Andreani Petrou (OIST).

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PROGRAM:

Mai Katada,

Title: Actions of automorphism groups of free groups on spaces of Jacobi diagrams

Abstract: We consider an action of the automorphism group $\mathrm{Aut}(F_n)$ of the free group F_n of rank n on the filtered vector space $A_d(n)$ of Jacobi diagrams of degree d on n oriented arcs. We study the $\mathrm{Aut}(F_n)$-module structure of $A_d(n)$ and obtain an indecomposable decomposition of $A_d(n)$ for n greater than or equal to 2d.

Yuanyuan Bao,

Title: Invariants for trivalent graphs and 3-manifolds that defined from quantized gl(1|1)

Abstract:A lot is known about the relation between the Alexander polynomial and the quantized universal enveloping algebra $U_q(gl(1|1))$. In this talk we summarize some known facts, show explicitly how to define invariants for trivalent graphs and 3-manifolds from $U_q(gl(1|1))$ and discuss many aspects of such invariants. Part of the talk is based on a joint work with Zhongtao Wu and a joint work with Noboru Ito.

Dror Bar-Natan,

Title: Rooting the BKT for FTI

Abstract: Following joint work with Itai Bar-Natan, Iva Halacheva, and Nancy Scherich, I will show that the Best Known Time (BKT) to compute a typical Finite Type Invariant (FTI) of type d on a typical knot with n crossings is roughly equal to $n^{d/2}$, which is roughly the square root of what I believe was the standard belief before, namely about n^d.

Andreani Petrou,

Title: Harer-Zagier formulas for families of twisted hyperbolic knots

Abstract: A discrete Laplace transform, called the Harer-Zagier transform, is applied to the HOMFLY-PT polynomials of some infinite families of twisted hyperbolic knots and closed formulas are derived. It is interesting to do so, since, whenever they turn out to be fully factorised rational functions, it may imply the existence of a Knot Matrix Model, in which the averages of characters equal the colored HOMFLY-PT polynomial of knots, a property

known as superintegrability. Thus far, such a model has only been successfully defined for the case of torus knots, but our results show that superintegrability may also hold for a hyperbolic family of Pretzel knots, which have fully factorised Harer-Zagier formulas. We also analyse the derived formulas for the non-factorised cases, which reveal a mysterious connection with ADE singularity theory.

Tentative schedule:

UT-OIST symposium of knot theory (each talk 40 min.,discussion 10 min. and break 10 min.)

		13:00-13:40	14:00-14:40	15:30-16:10	16:30-17:10
11th(Mon)		Mai Katada	Andreani Petrou	Dror Bar-Natan	Yuanyuan Bao