Program

17 September Tuesday

Place: West Bldg.8W, Ookayama Campus, Tokyo Institute of Technology
Room: W1008

15:00-16:00 Tetsuya Abe

The construction of smoothly slice knots 1

We review the construction of Cappell-Shaneson’s (homotopy) 4-spheres and Gompf’s 4-spheres. Then we explain how to obtain (possibly non-ribbon) slice knots from these 4-spheres.

18 September Wednesday

Place: West Bldg.8W, Ookayama Campus, Tokyo Institute of Technology
Room: W809

9:30-10:30 Tetsuya Abe

The construction of smoothly slice knots 2

We review the construction of (possibly non-ribbon) slice knots via annulus twists. We also explain some sufficient conditions for given slice knots to be ribbon. (arXiv:1305.7492v2)

11:00-12:00 Hye Jin Jang

Introduction to (h)-solvable filtration on the knot concordance group

We review the definition of the (h)-solvable filtration on the knot concordance group defined by Cochran, Orr, and Teichner. We discuss the development of obstructions for detecting (h)-solvability of knots, and known results about (h)-solvable filtration. Finally, we provide new 2-torsion elements in the knot concordance group related to this filtration.
13:00-14:00 Motoo Tange

**Knot concordance invariants coming from Floer homology**

We review some knot concordance invariants $\tau(K)$, $\delta(K)$, and $dS_{-1}(K)$, originated by Heegaard Floer homology. We discuss the relations of those invariants and the computation.

14:30-15:30 Min Hoon Kim

**Introduction to bipolar filtration**

We review the definition of the bipolar filtration of topologically slice knots and survey the recent results of Cochran-Harvey-Horn, Cochran-Horn and Cha-Powell. Also, we discuss open problems.

**19 September Thursday**

Place: West Bldg.8W, Ookayama Campus, Tokyo Institute of Technology
Room: W1008

9:30-10:30 Min Kyoung Song

**Introduction to Conant-Schneiderman-Teichner’s filtrations on (string) links**

We review the Whitney tower filtration of order on the set of concordance classes of (string) links. The filtrations are completely classified by Milnor invariants together with new higher-order Sato-Levine invariants and higher-order Arf invariants. Additionally, we see the relationship with Johnson filtrations and Goussarov-Habiro Y-filtrations on the group of concordance classes of string links and the group of homology cobordism classes of homology cylinders.

11:00-12:00 Hye Jin Jang

**Kauffman conjecture**

In 1982, Kauffman conjectured that sliceness of a knot $K$ can be read off from the information of curves on any Seifert surfaces of $K$. Recently, Cochran and Davis proved that the Kauffman conjecture is false for knots. (arXiv:1303.4418) We prove that the link version Kauffman conjecture is also false. This is a joint work with Minhoon Kim and Mark Powell.
13:00-14:00 Min Hoon Kim

Whitney towers, grope and Casson-Gordon style invariants of links

S. Friedl and M. Powell introduced a Casson-Gordon style invariant for 2-component links with linking number 1. Motivated from the seminal work of Cochran-Orr-Teichner, they conjectured that their invariant is an obstruction to being height 3.5 Whitney tower/grope concordant to the Hopf link. We give a proof of this conjecture. If time allows, we give generalizations of the classical results of J. Hillman and A. Kawauchi.

14:30-15:30 Min Kyoung Song

The homology cobordism group of homology cylinders with new homomorphism invariants

The homology cobordism group of homology cylinders is enlargement of both the mapping class group and the concordance group of string links in homology $D^2 \times I$. We see the structure of the group via the filtration of extended Milnor invariants. We also obtain Hirzebruch-type intersection form defect invariants, which can detect infinitely many elements invisible by existing homomorphism invariants.

20 September Friday

Place: Main Bldg, Ookayama Campus, Tokyo Institute of Technology Room: H206

10:00-11:00 Tetsuya Abe

Introduction to Rasmussen’s s-invariant

We briefly review Rasmussen’s s-invariant for knots.

11:20-12:00 Keiji Tagami

Rasmussen invariants of almost positive knots

It is known that the Rasmussen invariants of positive knots are computed from their positive diagrams. We compute the Rasmussen invariants of almost positive knots from almost positive diagrams.