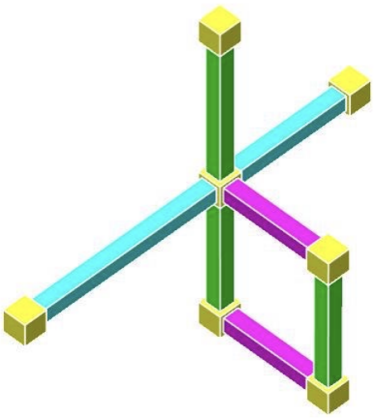
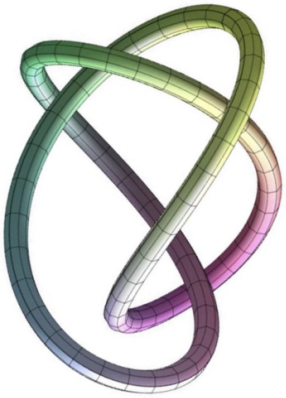
Knots and Spatial Graphs 2023

June 15-17, 2023





Organizers	Hwa Jeong Lee (Dongguk University WISE)
	Gyo Taek Jin (KAIST)
	Alexander Stoimenov (Dongguk University WISE)
Contact	hjwith(a)dongguk.ac.kr
	jingyotaek(a)kaist.ac.kr
	https://mathsci.kaist.ac.kr/~jin/meetings/K&SG2023.htm
Venue	KAIST / Mathematical Sciences / E6-1 / Rm 1401
Sponsors	National Research Foundation of Korea
	Dongguk University WISE
	KAIST

Thursday Afternoon, June 15

15:30 – 18:00 Registration & Discussion

Friday Morning, June 16

09:20 – 09:30 Opening Remarks

09:30 – 10:20 Ito, Tetsuya [Chair: G. T. Jin]

Chirally cosmetic surgeries for special alternating knots

10:20 – 11:10 Tanaka, Toshifumi [Chair: G. T. Jin]

On amphicheiral knots with symmetric union presentations

11:10 – 12:00 Stoimenov, Alexander [Chair: G. T. Jin]

Strong quasipositivity of links

Friday Afternoon, June 16

13:40 – 14:20 Nikkuni, Ryo [Chair: H. Kim]

Converses to generalized Conway–Gordon type congruences

14:20 – 15:10 Huh, Youngsik [Chair: H. Kim]

The Yamada polynomial of brunnian θ-curves

15:10 – 15:30 Break

15:30 – 16:20 Chbili, Nafaa [Chair: S. Oh]

Obstruction to quasi-alternating links

16:20 – 17:10 Lee, Jung Hoon [Chair: S. Oh]

One-two-way pass-move for knots and links

17:10 – 18:00 Choi, Sunmook [Chair: S. Oh]

Aztec Bipyramid and Dicube Tiling

Saturday Morning, June 17

09:30 – 10:20	Takioka, Hideo [Chair: S. Kim]
	S^N_m-crossing change and polynomial invariants of links
10:20 – 11:10	Jin, Gyo Taek [Chair: S. Kim]
	Petal number of torus knots of type $(r, r+2)$
11:10 – 12:00	Lee, Sang-Jin [Chair: S. Kim]
	Translation lengths of right-angled Artin groups on extension graphs

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Chbili, Nafaa

United Arab Emirates University / nafaachbili(a)uaeu.ac.ae

Obstruction to quasi-alternating links

Quasi-alternating links have been introduced by Ozsváth and Szabó while studying the Heegaard Floer homology of the branched double-covers of alternating links. This new class of links, which can be seen as a natural generalization of alternating links, is defined in a recursive way which is not easy to use in order to determine whether a given link is quasi-alternating. In this talk, we shall review the main obstruction criteria for quasi-alternating links. We also discuss how new examples of quasi-alternating links can constructed.

Choi, Sunmook

Korea University / felixchoi(a)korea.ac.kr

Aztec Bipyramid and Dicube Tiling

We consider the enumeration of dicube tilings, each of which is a three-dimensional tessellation of a polycube with dicubes. The enumeration of domino tilings of the Aztec diamond and the augmented Aztec diamond is well studied. As a three-dimensional analogue of the Aztec diamond, the Aztec bipyramid is the polycube consisting of unit cubes, which resembles a platonic octahedron. In this paper, we find a bijection between dicube tilings of the Aztec bipyramid and three-dimensional Delannoy paths, and use it to count the number of dicube tilings of the Aztec bipyramid.

Huh, Youngsik

Hanyang University / yshuh(a)hanyang.ac.kr

The Yamada polynomial of brunnian θ-curves

We investigate the difference between the Yamada polynomial of θ-curves and the Jones polynomial of the associated links of θ-curves. The resulting calculation shows that the two polynomials are equivalent to each other for brunnian θ-curves.

Ito, Tetsuya

Kyoto University / tetitoh(a)math.kyoto-u.ac.jp

Chirally cosmetic surgeries for special alternating knots

Two Dehn surgeries on a knot along different slopes are called chirally comsetic if they produce orientation-reversingly homeomorphic 3-manifolds. It is expected that such surgeries are quite limited. In this talk, after reviewing current knowledge on chirally cosmetic surgeries, we show that special alternating knots having sufficiently many twist regions do not admit chirally cosmetic surgeries. This makes a sharp contrast with special alternating knot with one twist region, the $(2, k)$ torus knots, which admits chirally cosemtic surgeries. The proof is based on a constraint from the degree two part of the LMO invariant and the Heegaard Floer homology, and careful estimations and computations of several knot invariants.

Jin, Gyo Taek

KAIST / jingyotaek(a)kaist.ac.kr

Petal number of torus knots of type $(r, r + 2)$

Let r be an odd integer, $r \geq 3$. Then the petal number of the torus knot of type $(r, r+2)$ is equal to $2r + 3$. This is a joint work with Hwa Jeong Lee.

Lee, Jung Hoon

Jeonbuk National University / junghoon(a)jbnu.ac.kr

One-two-way pass-move for knots and links

We define a local move for knots and links called the *one-two-way pass-move*, abbreviated briefly as the 1-2-*move*. The 1-2-move is motivated from the pass-move and the #-move, and it is a hybrid of them. We show that the equivalence under the 1-2-move for knots is the same as that of the pass-move: a knot K is 1-2-move equivalent to an unknot (a trefoil respectively) if and only if the Arf invariant of K is 0 (1 respectively). On the other hand, we show that the number of 1-2-moves behaves differently from the number of pass-moves.

Lee, Sang-Jin

Konkuk University / sangjin(a)konkuk.ac.kr

Translation lengths of right-angled Artin groups on extension graphs

For the right-angled Artin group action on the extension graph, it is known that the minimal asymptotic translation length is bounded above by 2 provided that the defining graph has diameter at least 3.

In the talk, we show that the same result holds without any assumption. This is done by exploring some graph theoretic properties of biconnected graphs, i.e., connected graphs whose complement is also connected.

Nikkuni, Ryo

Tokyo Woman's Christian University / nick(a)lab.twcu.ac.jp

Converses to generalized Conway–Gordon type congruences

It is known that for every spatial complete graph on $n \geq 7$ vertices, the summation of the the second coefficients of the Conway polynomials over the Hamiltonian knots is congruent to r_n modulo $(n-5)!$, where $r_n = (n-5)!/2$ if $n = 8k, 8k+7$, and 0 if $n \neq 8k, 8k+7$. Especially the case of $n = 7$ is famous as Conway–Gordon K_7 theorem. In this talk, conversely, we show that every integer $(n-5)!q + r_n$ is realized as the summation of the second coefficients of the Conway polynomials over the Hamiltonian knots in some spatial complete graph on n vertices.

Stoimenov, Alexander

Dongguk University WISE / stoimeno(a)stoimenov.net

Strong quasipositivity of links

I will survey some recent results (by myself and partial joint work with Tetsuya Ito) about deciding strong quasipositivity of various classes of links, the question whether all minimal genus surfaces of strongly quasipositive links are strongly quasipositive, and some related questions.

Takioka, Hideo

Saga University / takioka1986(a)gmail.com

S^N_m-crossing change and polynomial invariants of links

It is shown that there exists an infinite family of knots with the same HOMFLYPT polynomial by Kanenobu. However, it is still unknown whether an infinite family of knots with the same Kauffman polynomial exists. We focus on coefficient polynomials of the HOMFLYPT and Kauffman polynomials. It is shown that there exists an infinite family of links with the coefficient polynomials from 0-th to s-th for any s of the HOMFLYPT polynomial of any link by Kawauchi and Miyazawa independently. In this talk, we introduce a local change for links called an S^N_m-crossing change and show that there exists an infinite family of links with the coefficient polynomials from 0-th to s-th for any s of the HOMFLYPT and Kauffman polynomials of any link in each case.

Tanaka, Toshifumi

Gifu University / tanaka.toshifumi.s2(a)f.gifu-u.ac.jp

On amphicheiral knots with symmetric union presentations

In this talk, we characterize amphicheiral 2-bridge knots with symmetric union presentations and show that there exist infinitely many amphicheiral 2-bridge knots with symmetric union presentations with two twist regions. We also study 3-stranded pretzel knots with symmetric union presentations.

Participants

Nafaa Chbili	United Arab Emirates University	nafaachbili[AT]uaeu.ac.ae
Sunmook Choi	Korea University	felixchoi[AT]korea.ac.kr
Youngsik Huh	Hanyang University	yshuh[AT]hanyang.ac.kr
Tetsuya Ito	Kyoto University	tetitoh[AT]math.kyoto-u.ac.jp
Gyo Taek Jin	KAIST	jingyotaek[AT]kaist.ac.kr
Hun Kim	Korea Science Academy of KAIST	hunkim[AT]kaist.edu
Hyoungjun Kim	Korea University	kimhjun[AT]korea.ac.kr
Se-Goo Kim	Kyung Hee University	sgkim[AT]khu.ac.kr
Hwa Jeong Lee	Dongguk University WISE	hjwith[AT]dongguk.ac.kr
Jung Hoon Lee	Jeonbuk National University	junghoon[AT]jbnu.ac.kr
Sang-Jin Lee	Konkuk University	sangjin[AT]konkuk.ac.kr
Ryo Nikkuni	Tokyo Woman's Christian University	nick[AT]lab.twcu.ac.jp
Sungjong No	Kyonggi University	sungjongno[AT]kyonggi.ac.kr
Seungsang Oh	Korea University	seungsang[AT]korea.ac.kr
Ji Soo Song	Korea University	jss1725[AT]korea.ac.kr
Alexander Stoimenov	Dongguk University WISE	stoimeno[AT]stoimenov.net
Hideo Takioka	Saga University	takioka1986[AT]gmail.com
Toshifumi Tanaka	Gifu University	tanaka.toshifumi.s2[AT]f.gifu-u.ac.jp
Mi Jeong Yeon	Kyung Hee University	ym-501[AT]hanmail.net
Hyungkee Yoo	Ewha Womans University	hyungkee[AT]ewha.ac.kr
Martin Ziegler	KAIST	ziegler[AT]kaist.ac.kr