

Categorification in Mathematical Physics: April 9-13, 2018

Events for:
Monday, April 9th - Friday, April 13th

Monday, April 9th

9:00am **Beem, Christopher - SCGP 102**

Title: Vertex operator algebras and Higgs branches

Abstract: I will describe recent work to relate the vertex operator algebras that arise in connection with four-dimensional superconformal field theories to the Higgs branches of those same theories. I will mostly discuss work with Rastelli to extract the Higgs branch from the associated VOA. This story leads to interesting consequences for the modular properties of the Schur superconformal index. Time permitting, I will mention work in progress with Meneghelli and Rastelli on recovering the VOA from the Higgs branch.

10:30am **Dedushenko, Mykola - SCGP 102**

Title: On the gluing law in non-topological QFTs

Abstract:

11:45am **Nawata, Satoshi - SCGP 102**

Title:

Abstract:

2:30pm **Khovanov, Mikhail - SCGP 102**

Title: Categorification of the ring of integers with two inverted.

Abstract:

3:30pm **Tea**

4:00pm **Cooper, Ben - SCGP 102**

Title: Hall algebras of surfaces

Abstract:

Tuesday, April 10th

9:00am **Louis-Hadrien, Robert - 102 - SCGP 102**

Title: Foams and categorification

Abstract:

10:30am **Wedrich, Paul - 102 - SCGP 102**

Title: On categorification of skein modules and algebras

Abstract:

11:45am **Licata, Tony - 102 - SCGP 102**

Title: Artin groups and categorification

Abstract:

2:30pm **Putrov, Pavel - SCGP 102**

Title: Fermionic finite group gauge theories and (de)categorification

Abstract:

3:30pm **Tea**

Wednesday, April 11th

9:00am **Ng, Lenny - 102 - SCGP 102**

Title: Knot contact homology and colored HOMFLY-PT recursion

Abstract:

10:30am **Plamenevskaya, Olga - 102 - SCGP 102**

Title: Links of surface singularities and planar contact structures

Abstract:

11:45am **Rasmussen, Jake - 102 - SCGP 102**

Title: Floer homology for manifolds with torus boundary

Abstract:

2:30pm **Liu, Beibei - 102 - SCGP 102**

Title: Some geometric applications of the link Floer homology

Abstract: For links in the three sphere, there are two geometric questions: determining the Thurston polytope and 4-genus of links with vanishing pairwise linking numbers. I will explain how to use the Heegaard Floer homology introduced by Ozsvath and Szabo to determine the Thurston polytope, and give some bounds on the 4-genus in terms of the so-called h-function. In particular, for L-space links, the h-function can be computed explicitly by Alexander polynomials of the links and sublinks, and for L-space links with two components, the Thurston polytope is determined by Alexander polynomials of the links and sublinks in a combinatorial way. I will also show some examples for both of the questions.

3:30pm **Tea**

4:00pm **Shakirov, Shamil - SCGP 102**

Title: q-skein algebras as integrable systems

Abstract:

Thursday, April 12th

9:00am **Levenson, Caitlin - 102 - SCGP 102**

Title: DGA Representations, Ruling Polynomials, and the Colored HOMFLY-PT Polynomial

Abstract:

10:30am **Rozansky, Lev - SCGP 102**

Title: Triply graded HOMFLY-PT link homology from a stack of D2 branes.

Abstract: is a joint work with A. Oblomkov. I will review the 2-category underlying our matrix factorization-based construction of the HOMFLY-PT link homology and its 3d TQFT origin. I will also explain how this TQFT is derived from a string theory brane configuration which is conjecturally related to the Gukov-Schwarz-Vafa setup by moving the link-related NS5 branes into a position in which the D2 branes, which yield the link homology, assemble into a stack, thus producing a gauged 3d sigma model whose Higgs branch is the Hilbert scheme of points on \mathbb{C}^2 . A T-dual of our construction has a stack of D3 branes supporting the Langlands-related Kapustin-Witten model with NS5 and D5 inner walls.

11:45am **Oblomkov, Alexei - SCGP 102**

Title: Categorical Chern character and sheaves on the Hilbert scheme of points on plane

Abstract: Talk is based on the joint project with Lev Rozansky. In my talk I will explain categorical setting for the Chern character functor in 2-categorical setting. The method will be applied to KRS model from our previous work and we will obtain for a braid the complex of sheaves on the Hilbert scheme of points such that its homology is an isotopy invariant of the closure of the braid.

2:30pm **Hogancamp, Matt - 102 - SCGP 102**

Title: Curved complexes, Khovanov-Rozansky homology, and Hilbert schemes

Abstract:

3:30pm **Tea**

4:00pm **Sulkowski, Piotr - 102 - SCGP 102**

Title: Knots-quivers correspondence

Abstract: I will present a surprising relation between knot invariants and quiver representation theory, motivated by various string theory constructions. Consequences of this relation include the proof of one of the famous integrality conjectures of BPS invariants (i.e. Labastida-Marino-Ooguri-Vafa conjecture for symmetric representations), explicit (and unknown before) formulas for colored HOMFLY-PT polynomials for various knots, new viewpoint on knot homologies, a novel type of categorification, new dualities between quivers, solutions to certain combinatorial problems, and many others.

5:30pm **Banquet**

Friday, April 13th

9:00am **Pei, Du - SCGP 102**

Title: On categorification of the WRT invariant

Abstract:

10:30am **Gukov, Sergei - 102 - SCGP 102**

Title: From Donaldson-Thomas to Haydys-Witten

Abstract:

11:45am **Dimofte, Tudor - 102 - SCGP 102**

Title: (0,2) theories and the 4-simplex

Abstract:

2:30pm **Grassi, Alba - 102 - SCGP 102**

Title: From Painleve equations to quantum curves via gauge theory.

Abstract:

3:30pm **Tea**