

Equivariant Gromov-Witten Theory and Applications Workshop Talk Schedule

Events for:
Monday, May 12th - Friday, May 16th

Monday, May 12th

8:30am **Registration/Breakfast - SCGP Lobby and Cafe**

9:30am **Konstanze Rietsch - SCGP 102**

Title: On mirror symmetry for Grassmannians

Abstract: TBA

10:30am **Coffee Break - SCGP Cafe**

11:00am **Constantin Teleman - SCGP 102**

Title: The Toda isomorphism

Abstract: TBA

12:00pm **Lunch - SCGP Cafe**

2:15pm **Alexander Goncharov - SCGP 102**

Title: Representation theory and mirror symmetry

Abstract: We suggest a new way to parametrise canonical bases in representation theory, and argue that it is a manifestation a mirror symmetry, usually in an equivariant setting. This is a joint work with Linhui Shen (Yale graduate school)

3:15pm **Tea Time - SCGP Lobby**

4:00pm **Kentaro Hori - SCGP 102**

Title: The hemisphere partition function

Abstract: TBA

Tuesday, May 13th

8:30am **Breakfast - SCGP Cafe**

9:30am **Aleksey Zinger - SCGP 102**

Title: Mirror Symmetry for Stable Quotients Invariants

Abstract: We describe a mirror formula for the direct analogue of Givental's J-function in the SQ theory. The mirror formula in the SQ theory is remarkably similar to that in the Gromov-Witten theory, but the former does not involve a change of variables. This suggests that the mirror map relating the GW-invariants to the B-model of the mirror is more reflective of the choice of curve counting theory on the A side than of mirror symmetry. The proof of the mirror formula in the Fano case is as in the GW-theory. On the other hand, the proof in the Calabi-Yau case consists of showing that it is a consequence of the Fano case. This is joint work with Y. Cooper.

10:30am **Coffee Break - SCGP Cafe**

11:00am **Sushmita Venugopalan - SCGP 102**

Title: A symplectic analogue of quasimaps

Abstract: We consider Riemann surfaces obtained from nodal curves with infinite cylinders in the place of nodal and marked points. The space of finite energy vortices defined on such surfaces has a compactification. This compactified space is homeomorphic to the moduli space of quasimaps defined by Ciocan-Fontanine, Kim and Maulik.

12:00pm **Lunch - SCGP Cafe**

2:15pm **Emily Clader - SCGP 102**

Title: The Landau-Ginzburg/Calabi-Yau correspondence and wall-crossing

Abstract: The Landau-Ginzburg/Calabi-Yau correspondence is a proposed equivalence between two enumerative theories associated to a homogeneous (or, more generally, quasihomogeneous) polynomial: the Gromov-Witten theory of the hypersurface cut out by the polynomial in projective space, and the Landau-Ginzburg theory of the polynomial when viewed as a singularity. In this talk, I will describe a perspective on the LG/CY correspondence via variation of stability conditions. This interpretation allows the correspondence to be generalized from hypersurfaces to complete intersections, and it also points toward recent results and work-in-progress on wall-crossing formulas relating the two theories.

3:15pm **Tea Time - SCGP Lobby**

4:00pm **Cristina Manolache - SCGP 102**

Title: Comparing Gromov-Witten invariants and quasi-map invariants

Abstract: If for a given variety we have different types of curve-counting invariants it is in general very interesting to compare them. I will present a geometric method that allows us to attack this kind of problems and show how it works in the case of stable maps and stable quasi-maps to Grassmannians and Fano toric varieties.

Wednesday, May 14th

8:30am **Breakfast - SCGP Cafe**

9:30am **Kenji Fukaya - SCGP 102**

Title: Center of Mass technique and construction of equivariant Kuranishi structure

Abstract: In the situation where a symplectic manifold X has an action of compact Lie group preserving symplectic structure we can define Kuranishi structure on the moduli space of stable maps of arbitrary genus and arbitrary number of marked points. It seems that for this purpose the method of Section 15 of Fukaya-Ono's topology paper is easier to use than one of appendix of that paper. I will explain about these issue.

10:30am **Coffee Break - SCGP Cafe**

11:00am **James Pascaleff - SCGP 102**

Title: Symplectic cohomology and equivariant Lagrangian branes

Abstract: Borel-Weil theory constructs representations of semisimple groups in spaces of sections of homogeneous vector bundles on flag varieties. In this talk, we describe a construction in symplectic geometry which is meant to serve as the mirror dual to Borel-Weil construction. Building on the fundamental work of Seidel-Solomon, we define a notion of "equivariant Lagrangian brane" in an exact symplectic manifold M . In this context, the Lie algebra \mathfrak{g} lives inside the symplectic cohomology of M , and one may obtain representations of \mathfrak{g} on Floer cohomology of equivariant Lagrangian branes. We will make our construction completely explicit in the case of \mathfrak{sl}_2 . This is joint work with Yanki Lekili.

12:00pm **Lunch - SCGP Cafe**

2:15pm **Guangbo Xu - SCGP 102**

Title: Compactness of gauged Witten equation

Abstract: (joint work with Gang Tian) Recently, Fan-Jarvis-Ruan constructed the Landau-Ginzburg A-model theory based on the Witten equation for a quasi-homogeneous polynomial. In this talk, we consider the gauged version of Witten equation, which was also due to Witten, in his formulation of the gauged linear sigma model. We discuss some analytical issues, especially the compactness of the moduli space when we have to perturb the equation.

3:15pm **Tea Time - SCGP Lobby**

4:00pm **Chiu-Chu Melissa Liu - SCGP 102**

Title: Equivariant Gromov-Witten theory of the projective line and the Eynard-Orantin recursion

Abstract: TBA

5:30pm **Public Viewing of the Documentary Film: Particle Fever - SCGP 103**

Thursday, May 15th

8:30am **Breakfast - SCGP Cafe**

9:30am **Bumsig Kim - SCGP 102**

Title: Big I-functions

Abstract: We introduce a new big I-function for certain GIT quotients $W//G$ using the quasimap graph space from infinitesimally pointed projective line to the stack quotient $[W/G]$. This big I-function is expressible by the small I-function and conjecturally generates the Lagrangian cone of Gromov-Witten theory for $W//G$ defined by Givental. This talk is based on a joint work with Ionut Ciocan-Fontanine.

10:30am **Coffee Break - SCGP Cafe**

11:00am **Anders Buch - SCGP 102**

Title: Equivariant quantum cohomology and puzzles

Abstract: The "classical equals quantum" theorem states that any equivariant Gromov-Witten invariant (3 point, genus zero) of a Grassmann variety can be expressed as a triple intersection of Schubert classes on a two-step partial flag variety. An equivariant triple intersection on a two-step flag variety can in turn be expressed as a sum over puzzles that generalizes both Knutson and Tao's puzzle rule for Grassmannians and the cohomological puzzle rule for two-step flag varieties. These results together give a Littlewood-Richardson rule for the equivariant quantum cohomology of Grassmannians. I will speak about geometric and combinatorial aspects of this story, which is based on papers with Kresch, Purbhoo, Mihalcea, and Tamvakis.

12:00pm **Lunch - SCGP Cafe**

2:15pm **Renzo Cavalieri - SCGP 102**

Title: Toric open invariants and Crepant Transformations

Abstract: The question that the Crepant Resolution Conjecture (CRC) wants to address is: given an orbifold X that admits a crepant resolution Y , can we systematically compare the Gromov-Witten theories of the two spaces? That this should happen was first observed by physicists and the question was imported into mathematics by Y.Ruan, who posited as the search for an isomorphism in the quantum cohomologies of the two spaces. In the last fifteen years this question has evolved and found different formulations which various degree of generality and validity. Perhaps the most powerful approach to the CRC is through Givental's formalism. In this case, Coates, Corti, Iritani and Tseng propose that the CRC should consist of the natural comparison of geometric objects constructed from the GW potential for the space. We explore this approach in the setting of open GW invariants. We formulate an open version of the CRC using this formalism, and verify it for the family of A_n singularities. Our approach is well tuned with Iritani's approach to the CRC via integral structures.

3:15pm **Tea Time - SCGP Lobby**

4:00pm **Eduardo Gonzalez - SCGP 102**

Title: Applications of gauged GW theory

Abstract: I will explain a summary of several applications of gauged GW theory in the study of usual GW theory of GIT quotients. In particular I will explain how a wall-crossing formula yields a proof of a version of the crepant conjecture. We will discuss other results. This is joint work with Chris Woodward.

6:00pm **Workshop Banquet - SCGP Cafe**

Friday, May 16th

8:00am **Breakfast - SCGP Cafe**

9:00am **Hsian-Hua Tseng - SCGP 102**

Title: Virasoro beyond semi-simple cases

Abstract: TBA

10:00am **Coffee Break - SCGP Cafe**

10:30am **Leonardo Mihalcea - SCGP 102**

Title: An affine deformation of the quantum cohomology ring of flag manifolds

Abstract: A theorem of B. Kim identified the relations of the quantum cohomology ring of the (generalized) flag manifolds with the conserved quantities for the Toda lattice. M. Guest and T. Otofuji, and L. Mare, showed that if a similar quantum cohomology ring exists for affine flag manifolds, then its relations will be determined by the periodic Toda lattice. I will show how to construct a quantum ring which deforms the usual quantum cohomology ring and which depends on an additional affine quantum parameter. It turns out that the conserved quantities of the periodic Toda lattice give the ideal of relations in the new ring. The construction involves a generalization of the notion of "curve neighborhoods" of Schubert varieties, which were defined and studied earlier by the speaker in several joint works with A. Buch, P.E. Chaput, and N. Perrin. The current project is joint with Liviu Mare.

11:30am **Lunch - SCGP Cafe**

1:00pm **Michael McBreen - SCGP 102**

Title: Mirror Symmetry for Hypertoric Varieties

Abstract: Hypertoric varieties are hyperkahler analogues of toric varieties. I will describe their quantum cohomology, and discuss an approach to homological mirror symmetry for hypertorics which uses characteristic p representation theory.

2:00pm **short break - SCGP Cafe**

2:15pm **Hiroshi Iritani - SCGP 102**

Title: Equivariant quantum cohomology of toric stack

Abstract: TBA

3:15pm **Tea Time - SCGP Lobby**