Mohammed Abouzaid

Speculations about the Floer homotopy type

Cohen, Jones, and Segal proposed a construction for a homotopy type lifting Floer homology, for symplectic manifolds satisfying a stringent orientability condition that amounts to whenever the index bundle of the dbar operator. I will explain a conjectural framework for producing a category enriched in spectra (analogous to the Fukaya category), without making any orientability assumption. Much of what I will explain is joint work in progress with Andrew Blumberg and Thomas Kragh.

Denis Auroux

Speculations about homological mirror symmetry for affine hypersurfaces

The wrapped Fukaya category of an algebraic hypersurface H in (C*)^n is conjecturally related via homological mirror symmetry to the derived category of singularities of a toric Calabi-Yau manifold X, whose moment polytope is determined by the tropicalization of H. In this talk we will first explain the statement, and illustrate it for the case of the pair of pants; then we will outline some more speculative ideas about "relative" homological mirror symmetry for pairs ((C*)^n, H) and wrapped Fukaya categories of higher-dimensional pairs of pants.

Roger Casals

Morse flow trees in graph Legendrians

In this talk we will discuss holomorphic curves associated to cubic planar graphs, motivated by the study of open Gromov-Witten invariants. First, we shall see how the count of Morse flow trees involved in the contact homology of certain Legendrians relates to the combinatorics of the graph itself. Then, I will expain how Legendrian surgeries can be performed using graph combinatorics and relate the constructions to constructible sheaves. Time permitting, we shall explore the relation with moduli spaces of flat connections.

Kai Cieliebak

Poincare duality for free loop spaces

The Chas-Sullivan loop product on the homology of a free loop space and the Goresky-Hingston product on its cohomology fit together to a product on a larger space. This space satisfies a kind of Poincare duality and thus explains various dualities between loop space homology and cohomology observed over the past years.

Sylvain Courte

Generating functions and sheaves for Legendrian links in R^3

To a (generic) one-parameter family of functions (f_x) on a manifold M
we associate the graph of all critical values : this is the front projection of a Legendrian link L in R3
and (f_x) is called a generating function for L. Which Legendrian links admit a generating function?
How many up to equivalence? To deal with such questions it is natural to associate to a generating
function a sheaf on R2 microsupported on the Legendrian. We will discuss to what extent this is a
bijective correspondence. This is joint work (in progress) with Vivek Shende.

Jonny Evans

Bounding symplectic embeddings of rational homology balls in surfaces of general type

This is joint work with Ivan Smith. Developing ideas of T. Khodorovskiy and J. Rana, we prove that if the Milnor fibre of a Wahl singularity embeds symplectically in a (canonically polarised) surface of general type with b^+>1 then the length of the singularity is bounded above by 4K^2+7, where the length is the number of components of the exceptional divisor of the minimal resolution and K^2 is the square of the canonical class. This implies the corresponding length bound for singularities of stable surfaces of general type, which is an improvement on the current bound known to algebraic geometers (400(K^2)^4, due to Y. Lee). Our proof uses Seiberg-Witten theory and holomorphic curves.

Huijun Fan

Fukaya category of Landau-Ginzburg model

In this talk, I will describe the construction of the Fukaya category of Landau-Ginzburg model based on Witten equation with boundary conditions on Lefschetz thimbles. In particular, we can obtain the compactness theorem for the tame LG system. This is a joint work with Wenfeng Jiang and Dingyu Yang.

Kenji Fukaya

Moduli space to study Lagrangian Floer theory of divisor complement

In this talk I will explain a compactification of the moduli space of
pseudo holomorphic curves in the presense of smooth divisor.

This is related to the relative Gromov Witten theory and
my motivation is to use it in Lagrangian Floer theory of divisor
complemet, which will be used in my project with A Daemi
on Aniyah-Floer conjecture.
I also explain construction of Kuranishi structure on such
moduli spaces emphasising its difference from the case
of stable map compactification.
If time allows I mention its generalization to the case of
normal crossing divisor.

Sheel Ganatra

Liouville sectors and localizing Fukaya categories

We introduce a new class of non-compact symplectic manifolds, called Liouville sectors, and show they have well-behaved, covariantly functorial Fukaya categories. Weinstein manifolds frequently admit coverings by Liouville sectors, which can then be used to study the the Fukaya category of the total space. Our first main result in this setup is a local criterion for generating (global) Fukaya categories. One of our goals, using this framework, is to obtain a combinatorial presentation of the Fukaya category of any Weinstein manifold. This is joint work with John Pardon and Vivek Shende.

Ailsa Keating

Distinguishing Lagrangian submanifolds via holomorphic annuli

This is a report on joint work-in-progress with Mohammed Abouzaid. We present some methods for constructing examples of compact monotone Lagrangians in families of (n-1)-dimensional Milnor fibres; they can be upgraded to Lagrangians in C^n. We will explain how counts of holomorphic annuli can be used to distinguish Lagrangian links built this way. In the n=3 case, time allowing, we present strategies for using holomorphic annuli to tell apart connected Lagrangians.

Heather Lee

Pair-of-pants decompositions and Fukaya categories

We supply a suitable model for the wrapped Fukaya category of a punctured Riemann surface so that it can be explicitly computed in a sheaf-theoretic way, from the wrapped Fukaya categories of the pairs of pants in a decomposition. We will demonstrate one direction of HMS that the wrapped Fukaya category of a punctured Riemann surface is equivalent to the matrix factorization category MF(X,W) of the toric Landau-Ginzburg mirror (X, W). We might discuss further examples if circumstances permit.

Yanki Lekili

Mirror symmetry for punctured surfaces and Auslander orders

We consider partially wrapped Fukaya categories of punctured surfaces with stops at their boundary. We prove equivalences between such categories and derived categories of modules over the Auslander order on certain nodal stacky curves. As an application, we deduce equivalences between derived categories of coherent sheaves (resp. perfect complexes) on such nodal stacky curves and the wrapped (resp. compact) Fukaya categories of punctured surfaces of arbitrary genus and arbitrary non-zero number of boundary components. This is joint work with Polishchuk.

Mark Mclean

The Cohomological McKay Correspondence and Symplectic Cohomology.

Suppose that we have a finite quotient singularity C^n/G admitting a crepant resolution Y (i.e. a resolution with $c_1 = 0$). The cohomological McKay correspondence says that the cohomology of Y has a basis given by irreducible representations of G (or conjugacy classes of G). Such a result was proven by Batyrev when the coefficient field F of the cohomology group is Q. We give an alternative proof of the cohomological McKay correspondence in some cases by computing symplectic cohomology+ of Y in two different ways. This proof also extends the result to all fields F whose characteristic does not divide |G| and it gives us the corresponding basis of conjugacy classes in $H^*(Y)$. We conjecture that there is an extension to certain non-crepant resolutions. This is joint work with Alex Ritter.

Emmy Murphy

Pruned arboreal singularities and loose Legendrians

Following Nadler, we define a class of Lagrangian singularities, called pruned arboreal singularities. After explaining their definition of these and their geometric significance, we'll describe the space of constructable sheaves with singular support on these Lagrangians. Then we'll then prove that, supposing a pruned arboreal singularity admits no non-constant sheaves, it follows that its link is a loose singular Legendrian.

Lenny Ng

Recent developments in knot contact homology

I will discuss some new developments around knot contact homology. These may include an enhancement that completely determines the knot (joint work with Tobias Ekholm and Vivek Shende) and recent progress in the circle of ideas connecting augmentation varieties, fillings, colored HOMFLY recurrence, and topological strings (joint in progress with Tobias Ekholm).

Kaoru Ono

Twisted sectors in Lagrangian Floer theory

I will speak on a notion of twisted sectors in Lagrangian Floer theory in an appropriate setting. I also discuss it in some typical example and necessary ingredeints to construct a theory. It is based on a joint work (in progress) with Bohui Chen and Bai-Ling Wang.

Timothy Perutz

Fixed-point Floer homology in spaces of stable pairs over Riemann surfaces

Joint work with Andrew Lee. One can obtain 3-manifold invariants via symplectic avatars of gauge-theoretic constructions: Heegaard Floer homology as a model for Seiberg-Witten Floer homology, or Lagrangian Floer homology in representation varieties as a model for instanton homology. The latter approach is limited by difficulties with singularities. I will describe an approach to circumventing such problems by working in a space of stable (or Bradlow) pairs over a Riemann surface - a smooth, compact, monotone symplectic manifold. While Lagrangian submanifolds seem to be hard to construct, the action of the mapping class group leads to fixed-point Floer homology invariants, which we compute in the genus 1 case, and find that they contain the expected information form Seiberg-Witten theory.

Vivek Shende

Microlocal category for Weinstein manifolds via h-principle

On a Weinstein manifold, we define a constructible co/sheaf of categories on the skeleton. The construction works with arbitrary coefficients, and depends only on the homotopy class of a section of the Lagrangian Grassmannian of the stable symplectic normal bundle. The definition is as follows. Take any, possibly with high codimension, exact embedding into a cosphere bundle. Thicken to a hypersurface, and consider the Kashiwara-Schapira stack along the thickened skeleton. Pull back along the inclusion of the original skeleton. Gromov's h-principle for contact embeddings guarantees existence and uniqueness up to isotopy of such an embedding. Invariance of microlocal sheaves along such isotopy is well known.
We expect, but do not prove here, invariance of the global sections of this co/sheaf of categories under Liouville deformation.

Laura Starkston

Weinstein Skeleta with arboreal singularities

A Weinstein manifold has a core isotropic skeleton, from which one hopes to recover the symplectic topology (or at least the Fukaya category) of the Weinstein manifold. The canonical example of a skeleton is the zero section of a symplectic cotangent bundle. In general, the skeleton is not a smooth manifold, but can develop complicated singularities. We will try to show that every Weinstein manifold is homotopic to one with a skeleton with singularities only in a nice minimal class. There are finitely many models for the singularities allowed in dimension 2n, indexed by rooted trees corresponding to Nadler's arboreal singularities. Correspondingly, local calculations of the Floer theory near these singularities can be described combinatorially.

Zachary Sylvan

Spherical functors from Legendrian isotopies

I'll discuss the partially wrapped Fukaya category associated to a stop (e.g. a Legendrian) in the boundary of a Liouville domain and the Orlov-type functor associated to it. When the stop admits a certain type of self-isotopy, the corresponsing Orlov functor is spherical in the sense of Anno--Logvinenko. I'll discuss some basic consequences of this, as well as a tentative fillability obstruction.

Sara Venkatesh

Action-completed symplectic cohomology

I will define an action-completed symplectic cohomology theory for symplectic cobordisms and discuss its relationship to Rabinowitz Floer homology. I will illustrate the quantitative nature of this theory, as predicted through mirror symmetry, by examining its behavior on negative line bundles.

Christopher Woodward

Computations in Fukaya categories

I will discuss work in progress with S. Venugopalan and G. Xu on computations in Fukaya categories. Using the Abouzaid-Ganatra criterion we find split-generators for a certain class of symplectic manifolds (including, for example, the moduli space of stable genus zero marked curves with certain symplectic forms). As a consequence, we show that the quantum cohomology of this moduli space is semisimple.

Guangbo Xu

Gauged linear sigma model in the geometric phase

In this talk I will discuss the mathematical construction of Witten's gauged linear sigma model (GLSM) using methods from symplectic geometry. I will present how to use the moduli space of gauged Witten equation to define a Gromov--Witten type invariant. If time permits, I will also explain the relation between the GLSM invariants and the ordinary Gromov--Witten invariants via adiabatic limit. This is a joint work with Gang Tian.

Jingyu Zhao

A Smith inequality for fixed point Floer cohomology

We will describe an analogue of the classical Smith inequality for cyclic group of prime order p for fixed point Floer cohomology, which compares the ranks of the fixed point Floer cohomology of a symplectomorphism to its p-th iterations. The proof uses a construction of an equivariant p-th power map, which can be viewed as a noncommutative version of the classical Frobenius map. This work in progress is based on the previous work by P. Seidel in the case of p=2.