Agenda:
- Mirror symmetry for conifolds can be realized in the Gromov-Siebert program
- Morrison's conjecture

Def: A conifold is a CY 3 with an A1-singularities \((xy=zw)\)

Let \(\overline{X}\) be a conifold;
- \(\exists\) the way + to obtain smooth CY 3 for \(\overline{X}\).

\[ \text{Bl}_{Y=0} \overline{X} \xrightarrow{\text{flop}} \overline{X} \xrightarrow{\text{small}} X \]

\[ \text{Bl}_{Y=0} X \]

\[ S^2 \xrightarrow{\text{mor}} p \xrightarrow{\text{mor}} S^3 \]

\[ \mathbb{P}^1 \]

Reid's web conjecture:
All CY 3-manifolds are connected by sequences of conifold transitions (or reverse)

Conjecture: (Morrison) For \((X, Y) \in \text{CY}s / C-Y \text{ mirror}, \text{CT} \]

Note: for \(M_0\), you need a maximal degeneration.

\[ Y \leftarrow X \]

\[ X \]

\[ X_0 \]

\[ X_t \]
As part of the theory, need to extend G-S to orbifold points.

can construct small 1
from other log structures.

\[ \Delta \subset B := \text{dual intersection complex of } X_0, \]

\[ \Delta^\vee \subset B^\vee := \text{dual intersection complex of } X_0. \]

\[ i : B \setminus \Delta \to B \quad i : B^\vee \setminus \Delta^\vee \to B^\vee. \]

\[ \Delta B \setminus \Delta \text{ is integral tangent vectors on smooth loci.} \]

\[ \Delta^\vee B^\vee \setminus \Delta^\vee \text{ are tangent.} \]

\[ S \subset B \text{ subset of } \mu \text{-valent points in } \Delta; \]

\[ \text{tropical codimension points.} \]
SYZ, typical cycles, typical defect

locally E to objects of degeneracies or unstable

①

\[ xy - tw = 0 \]

\[ x_1 y_1 - n = 0 \]

\[ z w - u = 0 \]

Thus: (Castro-Bezem, Meers;)

let \( C = B \) be typical 2-cycle

C attached to one of the branches

planar

spatial

covering a sector of \( \Lambda \)

If \( \exists C \Rightarrow \) Friedman-Tian, satisfied for \( x_t \)

Smith-Thom-Yau for \( \overline{x}_t \)

Conjecture: This is an if and only if.
How do they relate to our work?

Thm: $C^B M$ cycles naturally live in tangent sheaf - decomposition.

$$H_2(B, \Delta; i_* \Lambda^3)$$

$$T \downarrow \text{actual map into}$$

$$H^1(B \setminus \Sigma, i_* \Lambda)$$

Conjecture $\iff T$ is surjective. (it's not injective.)

Counterexample:

Rec: It fails for

```
      r
     / \
    /   \  B
   /     i
```

Real $\ell$-curve $T^2$ s.t. discount way has a unif. point - spatial unif. point,
but: doesn't exist. Two cycle has inducing $\mathbb{Z}$.

Motivation: $C^B M$: C produces a 'typical' smashing.

Separate:

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  (\text{intersection})
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Infinite $\Lambda$-

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/\
/  \
/    \
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Smash.
Theorem: (j->klessi)

Physical 3-cycle.

Unraveled object, never singularizing.