5 minute talk EGN.

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B-model of Mirror Symmetry

1. Mirror symmetry in its original formulation was a conjectural isomorphism of CFT's. In particular, the generating function for curve counting $F_X^{GW}(\bar{t})$ for one Calabi-Yau manifold X is expressed through integrals of the holomorphic volume form Ω_t of the mirror family of manifolds $\hat{X}_t$.

$$F_X^{GW}(t) \longleftrightarrow \text{Variation of Hodge structure on } \hat{X}_t \tag{1}$$

2. Another CFT object to compute is a metric on the moduli space, which doesn't appear as a curve counting number and is, in fact, transcendental (as in Gamma conjecture). The problem is more or less equivalent to finding integrals of Ω in a special integral basis.
3. We use connection of the story above to Frobenius manifolds and complex oscillatory integrals to solve the B-model for many cases around FJRW points.
4. We also hope that our representation may be useful to solve other related problems.

Liouville gravity

1. It is a physical theory of 2-dimensional gravity with (intersection) numbers given by

$$LG_{g,n}(\bar{a}) \simeq \int\limits_{\overline{\mathcal{M}}_{g,n}} \langle V_{a_1} \cdots V_{a_n} \rangle_{LFT} \langle \Phi_{a_1} \cdots \Phi_{a_n} \rangle_{matter} \, \mathrm{d}m, \tag{2}$$

where the brackets denote some CFT expressions. Their generating function is

$$LG(\bar{\lambda}) = \sum_{\bar{a}} LG(\bar{a}) \prod_i \frac{\lambda_i^{a_i}}{a_i!} \tag{3}$$

2. It is believed to arise from matrix models (or integrable hierarchies)

$$\tau(\bar{t}) = \lim_{N\to\infty} \int\limits_{M \in Hermitian(N\times N)} \exp[\mathrm{Tr}\ V(M,t)] \, \mathrm{d}M, \tag{4}$$

after some nontrivial change of variables and analytic continuation $t \to t(\lambda)$

3. Direct computations in LG are very complicated, moreover, it is appealing to reduce it to already known theories of 2d gravity.