Mini-Workshop: Towards Quantum Primitive Form Theory

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As a joint program of the Kavli IPMU and the FMSP Program, a mini-workshop, "Towards Quantum Primitive Form Theory," was held on October 8-10, 2014 at the Kavli IPMU (organizers: Toshitake Kohno and Kyoji Saito). The aim was to cover some recent developments related to period maps for primitive forms, which may lead to understanding of the quantization of primitive forms. The schedule and the contents of the talks are as follows.

Oct.	10:00-11:30	13:30-15:00	15:30-17:00
8	Kapranov1	Iwaki1	Ikeda1
9	Ikeda2	Kapranov2	Iwaki2
10	Iwaki3	Ikeda3	Kapranov3

Akishi Ikeda (Graduate School of Mathematical Sciences, Univ. of Tokyo):
Stability conditions on *N*-Calabi-Yau categories associated to A_n-quivers and period maps

Recently, Bridgeland and Smith constructed stability conditions on some 3-Calabi-Yau categories from meromorphic quadratic differentials with simple zeros. In this talk, generalizing their results to higher dimensional Calabi-Yau categories, he described the space of stability conditions on *N*-Calabi-Yau categories associated to A_n-quivers as the universal cover of the compliment of the discriminant-loci of the universal deformation space of the simple singularity of type A_n. In particular, central charges of stability conditions on *N*-Calabi-Yau categories are constructed as the periods of quadratic differentials.

Kohei Iwaki (RIMS, Kyoto Univ.):
Theory of exact WKB analysis and relation to cluster algebras

Exact WKB analysis is an effective method for the global study of differential equations (containing a large parameter) defined on a complex domain. On the other hand, a cluster algebra is a particular class of commutative subalgebra of a field of rational functions with distinguished generators. He first gave an exposition of the theory of exact WKB analysis. In the third lecture he explained the main result on a hidden cluster algebra defined by a quiver associated with the Stokes graph in exact WKB analysis (a joint work with T. Nakanishi). The Voros symbols realize the cluster variables, which are generators of the cluster algebra.

Mikhail Kapranov (Kavli IPMU, Univ. of Tokyo):
Secondary polytopes and Landau-Ginzburg models

The secondary polytope of a point configuration A was originally introduced to describe the Newton polytope of a multivariate discriminant. The point configuration appeared as the set of exponents of the monomials of a polynomial. In these talks, based on joint work with M. Kontsevich and Y. Soibelman, he discussed a new appearance of secondary polytopes, when A is the set in the complex plane formed by the critical values of a complex Morse function. To these polytopes, he associates homotopy Lie algebras, which provide algebraic framework for a deformation theory construction of Picard-Lefschetz theory as proposed by the work of Gaiotto, Moore and Witten on the "Algebra of infrared."