CUHK-SYSU Joint Online Workshop on Geometry and Physics

Date: July 19, 2021 (Monday)
Venue: Online (via ZOOM)

Purpose: Due to the pandemic, it has become very difficult to have international visits nowadays. To facilitate academic communication in mathematics between Sun Yat-sen University (SYSU) and The Chinese University of Hong Kong (CUHK), we organize a series of joint online workshops. This is second workshop in the series, which will be fully supported by CUHK.

Organizers:

Kwokwai Chan (CUHK)

Naichung Conan Leung (CUHK)

Changzheng Li (SYSU)

Schedule:

09:00 – 10:00	Maurer-Cartan deformation of a Lagrangian by **Hansol Hong (Yonsei University)**
10:00 – 11:00	On Seidel representation of quantum K-theory of Grassmannians by **Changzheng Li (Sun Yat-Sen University)**
11:00 – 12:00	Holomorphic differential operators via Fedosov quantization by **Qin Li (Southern University of Science and Technology)**

Zoom link:

https://cuhk.zoom.us/j/91280841007
Meeting ID: 912 8084 1007
Passcode: 029340

Titles and abstracts:

Hansol Hong (Yonsei University)

Title: Maurer-Cartan deformation of a Lagrangian

Abstract: The Maurer-Cartan algebra of a Lagrangian is the algebra that encodes the deformation of its Floer complex as an A_∞ algebra. I will give a convenient description of the Maurer-Cartan algebra through a natural homological algebra language, and relate it with (a version of) Koszul duality for the Floer complex. It helps us to obtain the mirror-symmetry interpretation for the Maurer-Cartan deformation and its locality in SYZ situation. Namely, the Maurer-Cartan algebra provides a neighborhood of the point mirror to the Lagrangian, which varies in size depending on geometric types of Floer generators involved in the deformation

Changzheng Li (Sun Yat-Sen University)

Title: On Seidel representation of quantum K-theory of Grassmannians

Abstract: The K-theoretic quantum Pieri rule by Buch and Mihalcea implies a cyclic symmetry on the quantum K-theory of complex Grassmannian $Gr(k,n)$. In this talk, we will discuss applications of the Seidel representation. Especially, we will provide an accessible sufficient condition for the reduction of quantum Schubert structure constants of degree d to that of degree $d-1$. We will also introduce a quantum Littlewood-Richardson rule for $QK(Gr(3,n))$. This is my joint work with Chaoyang Liu, Jiayu Song and Mingzhi Yang.

Qin Li (Southern University of Science and Technology)

Title: Holomorphic differential operators via Fedosov quantization

Abstract: Although Toeplitz operators on Kähler manifolds associate smooth function to operators on Hilbert spaces $\mathcal{H} = H^0(X, L^k)$, their composition only gives a formal deformation quantization by considering the asymptotic $k \to \infty$ and turning $1/k$ to $\hbar$. In this talk, I apply the method of Fedosov to quantize a subclass of smooth functions $A \subset C^\infty(X)$ to holomorphic differential operators on $\mathcal{H}_k$. This gives a strong version of quantization since A acts on Hilbert spaces as differential operators which gives a non-formal deformation of the classical multiplication.