The Hong Kong University of Science and Technology

Department of Mathematics

Lecture Series on Geometry

Differential rings arising from special Kahler geometry
by

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Abstract

This lecture series is a continuation of the colloquium talk. I will discuss properties of certain differential rings constructed from period integrals for a class of one-parameter families of Calabi-Yau threefolds, focusing on the mirror quintic family example. One of the reasons that these differential rings are interesting is that the Gromov-Witten generating series for the Calabi-Yau threefolds are elements in this ring. These rings are introduced in the work of Bershadsky-Cecotti-Ooguri-Vafa and Yamaguchi-Yau, and have played an important role in understanding Gromov-Witten theory.

I will explain the construction of the rings from Weil-Petersson geometry, their generators and relations (including some algebraic independence results), the relation to variation of Hodge structures in both the A- and B-model, the issue of non-holomorphic completion and holomorphic limit, etc. I will first explain these results for the elliptic curve families as the motivating cases, and then generalize these results to the mirror quintic family analogously.

Lecture 1	**Tuesday, 29 October 2019**
Time:	**1:30p.m. - 3:00p.m.**
Venue:	**Room 5508, Academic Building (Lifts 25-26), HKUST**
Lecture 2	**Tuesday, 29 October 2019**
Time:	**3:20p.m. - 4:50p.m.**
Venue:	**Room 5508, Academic Building (Lifts 25-26), HKUST**

All are welcome!