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The Hong Kong University of Science and Technology

Department of Mathematics

Seminar on Pure Mathematics

Fractional Complete Intersections and New Mirrors

by

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Abstract

We will consider a class of Calabi-Yau varieties given by cyclic branched covers of a fixed semi Fano manifold. The first prototype example goes back to Euler, Gauss and Legendre, who considered 2-fold covers of $\mathbb{P}^1$ branched over 4 points. Two-fold covers of $\mathbb{P}^2$ branched over 6 lines have been studied more recently by many authors, including Matsumoto, Sasaki, Yoshida and others, mainly from the viewpoint of their moduli spaces and their comparisons. I will outline a higher dimensional generalization from the viewpoint of mirror symmetry. We will introduce a new compactification of the moduli space cyclic covers, using the idea of 'abelian gauge fixing' and 'fractional complete intersections'. This produces a moduli problem that is amenable to tools in toric geometry, particularly those that we have developed jointly in the mid-90's with S. Hosono and S.-T. Yau in our study of toric Calabi-Yau complete intersections. In dimension 2, this construction gives rise to new and interesting identities of modular forms and mirror maps associated to certain K3 surfaces. We also present a complete mirror theory in dimension 3, and discuss generalization to higher dimensions. The lecture is based on on-going joint work with S. Hosono, T.-J. Lee, H. Takagi, S.-T. Yau.

Date: Thursday, 16 May 2019

Time: 3:00p.m. - 4:00p.m.

Venue: Room 4504, Academic Building (near Lifts 25-26), HKUST

All are welcome!