



Institute of Mathematical Research
HKU



Department of Mathematics
HKUST



Department of Mathematics and IMS
CUHK

Hong Kong Geometry Colloquium March 19, 2016 (Saturday) Room 210, Run Run Shaw Bldg., HKU

Professor Jaehyun Hong

KIAS, Korea

Griffiths-Harris rigidity

10:00 - 11:00am

Given a projective variety, its Fubini forms and fundamental forms are basic differential invariants. Fubini forms are coefficients of the Taylor expansion of local expression of the embedding, so that a projective variety is uniquely determined up to projective equivalence by the infinite sequence of Fubini forms at a smooth point. If a projective variety is determined by its Fubini forms to k -th order, then we say that it is Fubini-Griffiths-Harris rigid to order k . On the other hand, fundamental forms contain only partial information, the leading coefficients of the Taylor expansion of local expression of the embedding. If a projective variety is determined by fundamental forms, then we say that it is Griffiths-Harris rigid. In this talk we will review results on these kinds of rigidity and non-rigidity of rational homogeneous varieties, and their generalizations to certain horospherical varieties of rank one.

11:00 - 11:30am

Tea Break

Professor Philip Boalch

Université de Paris-Sud, Orsay

Hyperkahler manifolds from connections and quivers

11:30am - 12:30pm

In string theory one is apparently supposed to replace a (Feynman) graph by a (Riemann) surface, to pass from a perturbative picture to a nonperturbative one. In the theory of hyperkahler manifolds there is a class of examples attached to graphs (and some data on the graph) --- the Nakajima quiver varieties, and a class of examples attached to Riemann surfaces (and some data on the surface, to specify the boundary conditions) --- the wild Hitchin spaces. I will talk about these "nonperturbative" hyperkahler manifolds attached to surfaces, and how in some cases they are related to graphs. This yields a new theory of "multiplicative quiver varieties", and enables us to extend work of Okamoto and Crawley-Boevey to see the appearance of many non-affine Kac-Moody Weyl groups and root systems in the theory of connections/Higgs bundles on Riemann surfaces (in contrast to the usual, local, understanding of affine Kac-Moody algebras, in terms of loop algebras).

This meeting is hosted by the Institute of Mathematical Research, HKU.

All are Welcome