The Hong Kong University of Science and Technology

Department of Mathematics

<u>Hong Kong Geometry Colloquium</u>

Saturday, 21 January 2006
Room 4502, Academic Building, (near Lifts 25 & 26), HKUST
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10:00a.m.-11:00a.m.

Professor Eyal Markman
University of Massachusetts at Amherst, USA

<u>Moduli spaces of sheaves on K3 and abelian surfaces:</u>
<u>their symmetries and monodromy</u>

We describe how equivalences of derived categories, of K3 and abelian surfaces, act on the cohomology of the collection of all smooth and compact moduli spaces of stable sheaves on such surfaces. Due to the effort of many authors, the action has an elegant description in terms of a groupoid G. The objects of G are the data needed to construct such a moduli space, namely a triple (S,v,H), consisting of a K3 or abelian surface S, an indivisible class v of its topological K-group (rank and chern classes) with $c_1(v)$ of Hodge type (1,1), and a v-generic ample line-bundle H on S. A morphism of G from (S,v,H) to (S',v',H') is an equivalence f:D(S) -> D(S') of the bounded derived categories of coherent sheaves, which maps v to v'.

We construct a representation of the groupoid G; a functor F from G to the category of algebras. F sends an object (S,v,H) to the cohomology of the corresponding moduli space M(S,v,H). Morphisms of G are sent by F to monodromy operators. The construction enables us to compute the monodromy group of the Hilbert scheme of length n zero dimensional subschemes of a K3 surface. The monodromy group is smaller than expected, if n-1 is not a prime power.

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* **11:00a.m.-11:30a.m.** Tea Break   *
* **Venue**: **Room 3493, Academic Building, (near Lifts 25 & 26), HKUST**   *
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11:30a.m.-12:30p.m.

Professor Denis Auroux
MIT, USA

<u>Homological Mirror symmetry for blowups of *CP*²</u>

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All are welcome!