



Institute of Mathematical Research

Department of Mathematics

Geometry Seminar

April 15, 2004 (Thursday)
517 Meng Wah Complex, HKU

Mr. Ho Yu TSUI
The University of Hong Kong

The Index of Kodaira Surfaces

3:00 – 4:00pm

Abstract

A Kodaira surface (or fibration) is a complex two-dimensional fibered manifold that is locally non-trivial. Over a topological manifold one can define the index (signature) which is a topological invariant like the Euler characteristic, the genus and the Chern numbers, etc. It has multiplicative property i.e. the index of a product manifold equals the product of the indices of its factors. According to a theorem of Chern-Hirzebruch-Serre this still holds on fibered manifold under certain assumptions. In 1967, Kodaira constructed a series of complex surfaces which do not obey this rule. He proved that these surfaces have positive indices. In this talk we shall explain Kodaira's construction. We shall also show that the indices of Kodaira's examples have the properties as mentioned.

4:00 – 4:15

Tea Break

Mr. JianJun CHENG
The Hong Kong University of Science and Technology

Invariants of Reflections and Dirac Cohomology

4:15 – 5:15pm

Abstract

Let $(\mathfrak{g}; \mathfrak{k})$ be a complex semisimple symmetric pair, and let \mathfrak{h} and \mathfrak{t} be suitable Cartan subalgebras of \mathfrak{g} and \mathfrak{t} respectively. We will study the restriction map

$$Res_{\mathfrak{h}/\mathfrak{t}} : S(\mathfrak{h})^{W(\mathfrak{g};\mathfrak{h})} \rightarrow S(\mathfrak{t})^{W(\mathfrak{k};\mathfrak{t})};$$

where $W(\mathfrak{g}; \mathfrak{h})$ and $W(\mathfrak{k}; \mathfrak{t})$ are, respectively, the Weyl groups of $(\mathfrak{g}; \mathfrak{h})$ and $(\mathfrak{k}; \mathfrak{t})$. We will also discuss Kostant's result on the above map when \mathfrak{k} is replaced by a reductive subalgebra of \mathfrak{g} and its relation to Dirac cohomology.

All are welcome
