

Hong Kong Geometry Colloquium

February 28, 2004 (Saturday)

Room 517, Meng Wah Complex, HKU

Professor M.S. Narasimhan

Tata Institute of Fundamental Research, Mumbai, India

Principal bundles in Algebraic Geometry

Abstract

Algebraic vector bundles and their moduli have been studied intensively over the past forty years. The corresponding questions for principal bundles (with arbitrary reductive groups as structure groups) were investigated in the case of Riemann surfaces around 1975 by A. Ramanathan. There has been a revival of interest in the study of principal bundles during last few years. The purpose of this talk is to give a survey of some of the recent results (in particular in positive characteristics) and to mention several open problems.

Professor Wing-Keung To

National University of Singapore, Singapore

L^2 metrics, projective flatness and families of polarized abelian varieties

Abstract

This talk is based on joint work with Lin Weng on the computation of the curvature of the L^2 -metric on the direct image of a family of Hermitian holomorphic vector bundles over a family of compact Kähler manifolds. As an application of the computation, we show that the L^2 -metric on the direct image of a family of ample line bundles over a family of abelian varieties and equipped with a family of canonical Hermitian metrics is always projectively flat. When the parameter space is a compact Kähler manifold, this leads to the poly-stability of the direct image with respect to any Kähler form on the parameter space.