

THE UNIVERSITY



OF HONG KONG

Institute of Mathematical Research

Department of Mathematics

Geometry Seminar

June 24, 2004 (Thursday)

517 Meng Wah Complex, HKU

3:00 – 4:00pm

Dr. Chi Hin Lau

HKU, Hong Kong

Holomorphic mappings from rational homogeneous manifolds of higher Picard number onto projective manifolds

4:00 – 4:20 pm

Tea Break

4:20 – 5:20pm

Dr. Gordon Heier

U. Bochum, Germany and Harvard U., USA

On finite type and subelliptic estimates

All are welcome

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Abstracts

Dr. Chi Hin Lau
HKU, Hong Kong

*Holomorphic mappings from rational homogeneous manifolds
of higher Picard number onto projective manifolds*

Let $f: S \rightarrow X$ be a nonconstant surjective holomorphic map between projective manifolds. It is a general principle in Complex Geometry that X is more "positively curved" than S . The projective space \mathbf{P}^n is the most positively curved manifold in the sense that its tangent bundle is ample. Lazarsfeld proved that if S is the projective space, then X is also the projective space of the same dimension. Rational homogeneous spaces of Picard number 1 are expected to be the next most "positively curved" manifold. If S is an n -dimensional rational homogeneous space of Picard number 1, Lazarsfeld asked whether X must be \mathbf{P}^n or biholomorphic to S . Hwang and Mok gave an affirmative answer to Lazarsfeld's Problem by showing that X is either the projective space or f is a biholomorphism. By the generalized Lazarsfeld Problem we mean an extension of Lazarsfeld's Problem to include the case of S of higher Picard number. In this case there is the additional possibility that f can be factored through a natural projection onto a rational homogenous space of smaller Picard number. In this talk, a sketch of a solution to this generalized Lazarsfeld Problem will be discussed.

Dr. Gordon Heier
U. Bochum, Germany and Harvard U., USA

On finite type and subelliptic estimates

In the first half of the talk, real real-analytic hypersurfaces of finite type are discussed without regard to subelliptic estimates. By means of a standard polarization argument, the study of the type of such hypersurfaces can be reduced to the study of the type of certain ideals of germs of holomorphic functions (to which algebraic methods can be applied). Special emphasis is put on the case of two variables, which is completely understood.

In the second half of the talk, an approach to an algebraization of Kohn's algorithm of producing subelliptic multiplier ideal sheaves is presented. This should eventually lead to effective subelliptic estimates for any real-analytic weakly pseudoconvex domain of finite type with the Sobolev exponent being a (polynomial) function of the type alone.