LOGARITHMIC COTANGENT BUNDLES, CHERN CLASSES, AND APPLICATIONS

Speaker: Lei Wu

Zhejiang University

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Abstract:

Using MacPherson's Euler obstruction function, one can identify the abelian group of constructible functions with the group of algebraic cycles on a smooth complex algebraic variety. Kashiwara's local index formula gives an alternative approach to this identification by using characteristic cycles for holonomic D-modules (they are Lagrangian cycles in the cotangent bundle). This identification then enables us to define Chern classes of algebraic cycles by using characteristic cycles. In this talk, I will first explain how to obtain Chern classes of the pushforward of Lagrangian cycles under an open embedding with normal crossing complement by using logarithmic cotangent bundles motivated by D-module theory. Then I will discuss applylications of such Chern classes in understanding Chern-Mather classes of very affine varieties and in proving the Involution Conjecture of Huh and Sturmfels in likelihood geometry. This work is joint with Maxim, Rodriguez, and Wang.