Hélène Esnault

Additive Chow Groups

Abstract

By work of Brieskorn, Arnold, Aomoto and others, one knows that the complex of global differential forms with log poles along a configuration of linear hyperpalnes in the projective spoace computes the de Rham cohomology of the complement. Furthermore, one knows that given the generators $d\log \ell_{i_1} \wedge \ldots \wedge d\log \ell_{i_p}$ of the log global log forms, where ℓ_i are the affine equations of the hyperplanes, the relations are classified by strata. As an example, if $(n+1)$-hyperplanes go through one point in $\mathbf{P}^n$, the alternate sum γ_n of the n-forms obtained by forgetting one hyperplane dies.

The higher Chow groups $CH^q(X,p)$ were defined by S. Bloch using the simplicial group of cycles defined on the simplical set $\Delta^\bullet$, $\Delta^n : x_1 + \ldots x_{n+1} = 1$. Replacing 1 by t and letting t go to 0, this yields to a definition of additive Chow groups $SH^q(X,q)$, where X is any variety over a field. The form γ_n above yields then an identification of $SH^n(k,n)$ with the absolute differential forms Ω_k^{n-1}. (Joint work with Spencer Bloch).

Peter Li

Manifolds with Positive Spectrum

Abstract

In this talk, I would like to discuss the geometry and topology of the class of manifolds that has a positive lower bound on the spectrum of the Laplace operator on functions. In particular, when the bound of the spectrum is sufficiently large relative to the Ricci curvature, then a splitting type theorem is valid. This theorem is a generalization of the work of Witten-Yau on the non-existence of worm hole in the AdS/CFT correspondence.