Hodge polynomials of some complete intersections

Michel BRION

To each complex algebraic variety X, one associates its 'Hodge polynomial', a polynomial in two variables denoted by $E_X(u,v)$ and uniquely determined by the following properties:

(i) $E_X(u,v) = \sum_{p,q} \dim H^p(X, \Omega^q_X)\, u^p\, v^q$ if X is smooth and projective,

(ii) $E_X(u,v) = E_Y(u,v) + E_Z(u,v)$ if X is the disjoint union of locally closed subvarieties Y, Z.

For instance, $E_X(u,u)$ is the 'virtual Poincaré polynomial of X' introduced by Fulton, and $E_X(-1,-1)$ is the Euler characteristic.

The talk will present an algorithm to compute Hodge polynomials of complete intersections in certain homogeneous spaces: flag varieties, and semi-abelian varieties. This extends results of Danilov and Khovanskii that determine the Hodge polynomials of complete intersections in toric varieties. The main ingredient is a generalization of Hodge polynomials to triples (X, D, L), where X is a smooth projective complex variety, $D \subset X$ a simple normal crossings divisor, and $L \to X$ a line bundle.