Complex analytic vanishing cycles for formal schemes.

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Abstract

Let \( R = \mathcal{O}_{\mathcal{C}, 0} \) be the ring of power series convergent in a neighborhood of zero in the complex plane. Every scheme \( \mathcal{X} \) of finite type over \( R \) defines a complex analytic space \( \mathcal{X}^h \) over an open disc \( D \) of small radius with center at zero. The preimage of the punctured disc \( D^* = D \setminus \{0\} \) is denoted by \( \mathcal{X}^h_\eta \), and the preimage of zero coincides with the analytification \( \mathcal{X}^h_s \) of the closed fiber \( \mathcal{X}_s \) of \( \mathcal{X} \). The complex analytic vanishing cycles functor associates to every abelian sheaf \( F \) on \( \mathcal{X}^h_\eta \) a complex \( R\Psi_\eta(F) \) in the derived category of abelian sheaves on \( \mathcal{X}^h_s \) provided with an action of the fundamental group \( \Pi = \pi_1(D^*) \). In this talk I’ll explain a result from my work in progress which implies that, if \( F \) is the locally constant sheaf \( \Lambda_{\mathcal{X}^h_\eta} \) associated to an arbitrary finitely generated abelian group \( \Lambda \) provided with an action of \( \Pi \), the restriction of the complex \( R\Psi_\eta(\Lambda_{\mathcal{X}^h_\eta}) \) to the analytification \( \mathcal{Y}^h \) of a subscheme \( \mathcal{Y} \subset \mathcal{X}_s \) depends only on the formal completion \( \widehat{\mathcal{X}}/\mathcal{Y} \) of \( \mathcal{X} \) along \( \mathcal{Y} \). The result itself tells that the construction of the vanishing cycles complexes can be extended to the category of special formal schemes over the completion \( \widehat{R} \) of \( R \).

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4:00 pm
Smith Hall 204

Tea and refreshments will be served at 3:45pm.

http://math.newark.rutgers.edu/~xiaowwan/Colloquium/