1014-14-340 **Hal Schenck*** (`schenck@math.tamu.edu`), Mathematics Department, Texas A&M University, College Station, TX 77843-3368, and **Paulo Lima-Filho** (`plfilho@math.tamu.edu`), Mathematics Department, Texas A&M University, College Station, TX 77843-3368. *Holonomy Lie algebras, Graphic Arrangements, and* $Tor_i^A(k,k)_i$.

If $X$ is the complement of a hypersurface in $\mathbb{P}^n$, then Kohno showed that the nilpotent completion of $\pi_1(X)$ is isomorphic to the nilpotent completion of the holonomy Lie algebra of $X$. When $X$ is the complement of a hyperplane arrangement, the ranks $\phi_k$ of the lower central series quotients of $\pi_1(X)$ may be computed from $Tor_i^A(k,k)_i$, where $A$ is the cohomology ring of $X$. The $\phi_k$ are known in only two very special cases: if $X$ is hypersolvable (a linear slice of an arrangement which admits a sequence of linear fibrations), or if the holonomy Lie algebra decomposes in degree $\geq 2$ as a direct product of local components. We use the holonomy Lie algebra to obtain a formula for $\phi_k$ for graphic arrangements. This generalizes Kohno's result for braid arrangements, and provides the first instance of an LCS formula for arrangements which are not decomposable or hypersolvable. (Received September 11, 2005)