1084-52-290 **Felix Breuer*** (felix@fbreuer.de). *Ehrhart f^*-vectors and hypergraph coloring complexes.*
In recent years, Ehrhart theory has found a number of applications in combinatorics. The idea is to model combinatorial counting functions as Ehrhart functions of suitable geometric objects and then apply theorems from Ehrhart theory to obtain results. In this talk, we will examine the chromatic polynomial of hypergraphs from an Ehrhart perspective. This approach leads naturally to hypergraph coloring complexes. One interesting fact is that these complexes do not, in general, have a non-negative Ehrhart h^*-vector (or Ehrhart δ-vector), while their f^*-vector, on the other hand, is always non-negative. It turns out that this is no accident: Ehrhart f^*-vectors of polytopal complexes are always non-negative, even if the complex is non-convex and does not have a unimodular triangulation. Moreover, the f^*-coefficients of Ehrhart polynomials have a concrete counting interpretation. An interesting corollary is that this property characterizes Ehrhart polynomials of partial polytopal complexes: A polynomial is the Ehrhart polynomial of some partial polytopal complex if and only if its f^*-vector is non-negative. (Received September 04, 2012)