

**Meeting:** 998, Houston, Texas, SS 21A, Special Session on Homological Algebra of Commutative Rings

998-13-298      **Alexandre Tchernev\*** (tchernev@math.albany.edu). *Free resolutions for multigraded modules.*

Let  $K$  be a field and  $R = K[x_1, \dots, x_n]$  be the polynomial ring over  $K$  with the usual  $\mathbb{N}^n$ -grading (multigrading). Let  $M$  be a Noetherian multigraded  $R$ -module with minimal (multihomogeneous) presentation  $R^f \xrightarrow{X} R^g \longrightarrow M \longrightarrow 0$ , where  $X$  is a monomial matrix. We use the combinatorial information encoded in the matroid associated with  $X$  to construct an explicit free resolution of  $M$ . We discuss some of the homological properties of  $M$  that can be deduced from this construct, and some interesting open questions. (Received March 01, 2004)