

Meeting: 998, Houston, Texas, SS 2A, Special Session on Representations of Algebras

998-05-294 **Ahmet Seven*** (aseven@lynx.neu.edu), 360 Huntington Ave., Department of Mathematics,
Northeastern University, Boston, MA 02115. *Recognizing cluster algebras of finite
type*. Preliminary report.

One of the most striking results in the theory of cluster algebras due to S.Fomin and A.Zelevinsky is the classification of cluster algebras of finite type which turns out to be identical to the Cartan-Killing classification. This result can be stated purely combinatorially in terms of certain transformations (“mutations”) of certain edge-weighted directed graphs (“diagrams”). Namely, a diagram is called 2-finite if every mutation-equivalent diagram has all edge weights equal to 1,2 or 3; Fomin and Zelevinsky prove that a diagram is 2-finite if and only if it is mutation-equivalent to a Dynkin diagram. We will discuss a complete solution of the following natural recognition problem: how to recognize whether a given diagram is 2-finite without having to perform an unspecified number of mutations. We solve this problem by providing the complete list of all minimal 2-infinite diagrams. The list contains all extended Dynkin diagrams but also has 6 more infinite series, and a substantial number of exceptional diagrams with at most 9 vertices. A very similar list appears in Happel and Vossieck’s work on minimal algebras of infinite representation type with preprojective component. (Received March 01, 2004)