Cluster Algebras and quiver Representations. Definition and Motivations

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To every quiver Q is associated a Fomin Zelevinsky (skew--symmetric) cluster algebra. These are commutative rings, introduced by Fomin and Zelevinsky in 2001, which provide an algebric/combinatorial framework for the study of total positivity and dual canonical bases of semisimple algebraic groups. We will give some motivating examples for their introduction. In particular we will see that there are several notions of "positivity" in a cluster algebra.