

## **From representation theory to maximal green sequences**

Gordana Todorov, Northeastern University, Boston, MA

In this talk I will show how quiver representations are used to prove theorems about maximal green sequences, a notion related to BPS states in physics.

First I will describe semi-invariants on presentation spaces and their relations to cluster theory (joint work with Igusa, Orr, and Weyman). This is similar to the original work of A. King, Schofield, Derksen, Weyman, however this approach is a perfect set-up for the cluster theory introduced by Fomin, Zelevinsky. The domains of the semi-invariants that we consider, define a "picture" as used by Igusa, Orr, which is a particular triangulation of a sphere, with the highest dimensional simplices being the cluster tilting objects of the corresponding cluster category.

By proving that the weights labeling those domains together with the semi-invariant picture give essential information about c-vectors of the associated cluster algebra, we introduced a new way of dealing with maximal green sequences, certain sequences of mutations in the direction of positive c-vectors.

This is used in the proofs of two conjectures about maximal green sequences (joint work with Bruestle, Hermes, Igusa).

*Advances in Representation Theory of Algebras (ARTA)*

(CIMAT), Guanajuato, Mexico

June 22-26, 2015