Cluster Algebras
Algèbres amassées

ASLAK BAKKE BUAN, Norwegian University of Science and Technology
Cluster-tilted algebras and quiver mutation

Quiver mutation is a special case of cluster mutation, as defined by Fomin and Zelevinsky. Cluster-tilted algebras are finite dimensional algebras whose representation theory is closely related to the representation theory of hereditary algebras. We discuss connections, including some recent developments.

The talk will partially be based on joint work with Robert Marsh and Idun Reiten.

SERGEY FOMIN, University of Michigan, Ann Arbor, MI
Cluster complexes of bordered surfaces

To an oriented surface with boundary and finitely many marked points one can associate a pure simplicial complex, the cluster complex of the corresponding cluster algebra. In a joint work with Michael Shapiro and Dylan Thurston, we provide an explicit combinatorial description of this complex, and determine its homotopy type and its growth rate.

RALF SCHIFFLER, UMASS Amherst, Lederle Graduate Research Tower, Amherst, MA 01003-9305, USA
m-replicated algebras and m-cluster categories

Let A be a hereditary algebra. Its cluster category as well as its m-cluster category are by definition quotients of the derived category $\mathcal{D}^b(\operatorname{mod} A)$. One can construct a fundamental domain for these categories as the left part, respectively the m-left part, of the m-replicated algebra of A.

In this talk, we will define the m-replicated algebra, its (m-)left part and study the projective dimension of its indecomposable modules, which is crucial for the construction of the fundamental domain mentioned before.

HUGH THOMAS, Department of Mathematics and Statistics, University of New Brunswick, Fredericton, NB
Noncrossing partitions via representations of quivers

We show how the combinatorics of clusters (viewed as tilting objects in the cluster category) can be related to the combinatorics of the noncrossing partitions of the associated Coxeter group. It is known that, for an arbitrary quiver Q, the tilting objects in the cluster category for Q are in bijection with partial tilting objects in rep Q which are tilting on their support. We show that these are also in bijection with the exact abelian extension-closed subcategories of rep Q. Further, if Q is of finite or affine type, these are also in bijection with the noncrossing partitions of the reflection group associated to Q. When Q is of finite type, we recover Reading's bijection between clusters and noncrossing partitions. This perspective also provides a new proof that, in finite type, the noncrossing partitions form a lattice, which was first given a type-free proof by Brady and Watt in 2005.

This is joint work with Colin Ingalls (UNB).

GORDANA TODOROV, Northeastern University, Boston, Massachusetts, USA
m-cluster categories and m-replicated algebras

Let A be a hereditary algebra over an algebraically closed field. We prove that an exact fundamental domain for the m-cluster category of A is the m-left part of the m-replicated algebra $A^{(m)}$ of A. Moreover, we obtain a one-to-one correspondence between the tilting objects in the m-cluster category (that is, the m-clusters) and those tilting $A^{(m)}$-modules for which all non projective-injective direct summands lie in the m-left part of $A^{(m)}$.

Joint work with I. Assem, T. Brüstle and R. Schiffler.