Martina Lanini
The University of Melbourne

Title: The Stable Moment Graph and Periodic Structures in the Affine Category $\mathcal{O}$

Abstract: We associate with any affine Kac-Moody algebra $\mathfrak{g}$ its stable moment graph. Such a graph turns out to be the main tool in order to get a categorical version of a result by Lusztig, stating certain stability property for affine Kazhdan-Lusztig polynomials. This stabilisation phenomenon bridges the Hecke algebra to its periodic module, which -according to the Feigin-Frenkel conjecture- governs the representation theory of $\mathfrak{g}$ at the critical level. The stable moment graph is expected to enable us to apply moment graph techniques to the study of critical representations (joint with P. Fiebig).

Joanna Meinel
Max Planck Institute for Mathematics, Bonn

Title: Primitive Ideals and Primitive Quotients of Generalizations of Weyl Algebras

Abstract: We give two applications of results by Musson and Van den Bergh on primitive ideals (the annihilators of simple modules) and primitive quotients (the quotients by the primitive ideals) for generalizations of Weyl algebras. Firstly (joint with Catharina Stroppel), we consider central subquotients of Weyl algebras (the ring of differential operators on a polynomial ring). Based on a description of their primitive quotients in terms of lattices and polyhedral cones, we obtain common quasi-polynomials for the Goldie rank of such primitive quotients. These quasi-polynomials encode the behavior under dilation of the parameter defining the primitive quotient and are inspired by the corresponding construction for the universal enveloping algebra of a semisimple Lie algebra (for instance by Joseph). Crucial for the study of primitive ideals of universal enveloping algebras is Duflo's theorem that any primitive ideal is in fact the annihilator of a highest weight module. In the second part we define highest weight modules for generalized Weyl algebras and present a Duflo theorem for a special family of generalized Weyl algebras. Reference: Joanna Meinel and Catharina Stroppel: Goldie rank of primitive quotients via lattice point enumeration, to appear in Glasg. Math. J. 2013.

Emily Norton
Boston College

Title: Symplectic Reflection Algebras of Elementary Abelian p-Groups Viewed as Ore Extensions

Abstract: There exist families of algebras in characteristic p which are deformations of the smash product of a polynomial ring with the cyclic group of order p or with the wreath product of that cyclic group with a symmetric group, and which look similar to symplectic reflection algebras. Technically, the name symplectic reflection algebra does not apply, and the lack of an appropriate name foreshadows structural differences. In contrast to the familiar story, these "symplectic reflection algebras" of the cyclic group admit a description as Ore extensions via an interesting derivation which, in the simplest example, has a life beginning in the 19th century with the work of André on the enumeration of alternating permutations. The algebras corresponding to this derivation possess a large center and a two-parameter family of finite-dimensional simple representations. A similar story is true when the cyclic group is replaced with an elementary abelian p-group.