Eliyahu Matzri: On the symbol length of symbols in Galois cohomology.

Fix a prime p and let F be a field with characteristic not p. Let G_F be the absolute Galois group of F and let μ_{p^s} be the G_F-module of roots of unity of order dividing p^s in a fixed algebraic closure of F. Let $\alpha \in H^n(F, \mu_{p^s}^{\otimes n})$ be a symbol (i.e $\alpha = a_1 \cup \cdots \cup a_n$ where $a_i \in H^1(F, \mu_{p^s})$) with effective exponent dividing p^{s-1} (that is $p^{s-1}\alpha = 0 \in H^n(G_F, \mu_p^{\otimes n})$). In this work we show how to write α as a sum of symbols coming from $H^n(F, \mu_{p^{s-1}}^{\otimes n})$ that is symbols of the form $p\gamma$ for $\gamma \in H^n(F, \mu_{p^s}^{\otimes n})$. If $n > 3$ and $p \neq 2$ we assume F is prime to p closed and of characteristic zero.

Max Gurevich: Quantum group perspective on the hypercube decomposition for Kazhdan-Lusztig polynomials.

A recent collaboration of Williamson with Google's DeepMind researchers has produced a new inductive method for the construction of symmetric group Kazhdan-Lusztig polynomials. Their proof detects a combinatorial phenomenon, hypercube decomposition, which is then proved through analysis of perverse sheaves on Schubert varieties.

I would like to discuss a natural categorification of this decomposition which becomes visible when placing the Kazhdan-Lusztig theory in the context of canonical bases for quantum groups. This approach provides an alternative algebraic proof for the new algorithm. This is a joint work with Chuijia Wang.

Sefi Ladkani: Non-degenerate potentials on some exceptional quivers

The theory of quivers with potential introduced by Derksen, Weyman and Zelevinsky has various connections to representation theory and theoretical physics (e.g. dimer models). For its application to cluster algebras, it is important that the potential possesses a property of being "non-degenerate".

Over an uncountable base field, any quiver admits a non-degenerate potential. However, the proof of this fact is not constructive and thus some questions still remain: Given a quiver, can one write down explicitly a non-degenerate potential? Is a non-degenerate potential unique (in a suitable sense)?

We will survey some older results concerning these questions for various classes of quivers, and then present recent results for the exceptional quiver $X7$ (introduced by Derksen and Owen), confirming a conjecture by Geiss, Labardini and Schroer, thus settling the above questions for all the quivers of finite mutation type. We will also discuss representation theoretic properties of the associated Jacobian algebras.