Algebra and Number Theory Seminar

Title: On certain algebraic constructions of symmetric graphs

Speaker: Bostjan Kuzman (Ljubljana)

Date: Thu 27th February 2020 at 2:00PM

Location: Seminar Room SCN 1.25

Abstract: The symmetry of a graph is usually described by the action of its automorphism group on the set of vertices, edges, s-arcs, etc. While several methods of constructing families of graphs with a prescribed symmetry type are well-known, complete classifications are hard to obtain. In order to complete and generalize results of Gardiner and Praeger on 4-valent symmetric graphs (European J. Combin, 15 (1994)) we applied the method of lifting automorphisms in the context of elementary-abelian covering projections. In particular, we described the vertex- and edge-transitive graphs whose quotient by a normal p-elementary abelian group of automorphisms is a cycle, in terms of common invariant substaces of their matrix representation. The symmetry properties of such graphs correspond to the properties of the generating polynomials of cyclic and negacyclic codes, that is, divisors of $x^n \pm 1 \in F_p[x]$.

(Joint work with A. Malnic and P. Potocnik)

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