Yom iuyn on Algebraic Combinatorics

On the occasion of the retirement of Prof. Mikhail Klin

Will take place on March 29, 2016 at the Department of Mathematics of Ben-Gurion University of the Negev (room -101, building 58).

PROGRAM

10:20- 10:40: Opening

Prof. Menachem Kojman, Chair

Prof. Michael Lin

10:40-11:25: Matan Ziv-Av (BGU) *"Constructive enumeration of the coherent configurations"*

Abstract:
A coherent configuration is a partition of the arc set of a complete directed graph with some extra requirements. Coherent configurations correspond to (some) subalgebras of the complete matrix algebra of the corresponding order. As such a two faced concept, coherent configurations play a significant role in algebraic graph theory. Using a computer we constructed all coherent configurations of orders no more than 15 (up to isomorphism). One result of this enumeration is discovery of (the unique) non-Schurian coherent configuration of order 14. All coherent configurations of orders up to 13 are Schurian, so this is the smallest non-Schurian coherent configuration. We will consider this project in a wider context by discussing computer aided enumeration efforts for some subclasses of coherent configurations such as association schemes, Schur rings, and strongly regular graphs.The talk will also include a detailed description of the techniques used to achieve the reported results.

11:25- 11:40: Coffee break

11:40-12:15: Nimrod Kriger (BGU and SCE) *"Enumeration of pseudo Paley graphs arising from mergings of the classical affine scheme"*.

Abstract:
For p an odd prime, let A_p be the complete classical affine association scheme on p^2 points of rank p+2, which is obtained from the classical affine plane. By mergings of basis relations we construct rank 3 fusion schemes with two non-trivial basis relations having equal valencies. The basis graphs associated with these relations are pseudo Paley graphs. We established a method to calculate the number of these graphs (up to isomorphism). Moreover, we found how many graphs are self-complementary and how many are non-self-complementary. This talk is based on a joint project together with Misha Klin and Andy Woldar.

12:20-12:55: Ruvim Lipyanski (BGU) "*Wild and superwild problems in algebra*"

Abstract:
We reduce the isomorphism problem for undirected graphs without loops to the isomorphism problem for some class of finite dimensional 2-step nilpotent Lie algebras over a field K as well as for some class of finite p-groups.We show that the isomorphism problem for graphs is harder than the two latter isomorphism problems in the sense of Borel reducibility. An analogue of Borel reducibility in terms of computable functions was introduced by S. Coskey, J.D. Hamkins, and R. Miller in 2011. A relation of the isomorphism problem for undirected graphs to the well-known problem of classifying pairs of matrices over a field (up to similarity) will be also considered.
This talk is based on a recently published joint paper with N. Vanetik.

13:00: Lunch break

14:00: Refreshments

14:30-15:30: Mikhail Muzychuk (Netanya Academic College) "*Isomorphism problem for Cayley combinatorial objects*" (This lecture willl be given in the framework of the Department colloquium)

15:35 - Gathering with refreshments and serviced food.