**MINI-WORKSHOP  on**  **FINITE GROUPS AND THEIR AUTOMORPHISMS**

**Abstracts of the Workshop Presentations**

***Marian Deaconescu****, An introduction to group actions.*

My lectures will focus on some of the most general (you might read ''shallow'', or, ''not deep'', or ''elementary'') aspects of the action of a finite group A which acts via automorphisms on a finite group G.

I think that, today, the general theory (in the context described above) is in its infancy and I am ready to babble something on these lines.

I plan to start from first principles, giving (?) boring proofs of three lines, and finishing with things (yes, elementary mathematics can be surprising) that give an answer to an old problem (no, not an ''old open question'', for nobody believed that this question could be ever answered...) that preoccupied both Dedekind and Frobenius around 1890: when is a product of two commutators in a finite group again a commutator?

Applications to number theory will be also presented, including a characterization of the Mersenne primes.

I am ''old school'' , I will write on a board (with aiding notes and glasses at hand), so please bring your pens and your notebooks...
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  ***Gulin Ercan****, Frobenius-like groups as groups of automorphisms.*

These talks will discuss some developments about the structure of finite groups admitting a Frobenius-like group as a group of automorphisms. This is essentially a continuation and generalization of the research of Khukhro, Makarenko and Shumyatsky about the structure of finite groups admitting a Frobenius group as a group of automorphisms. For a first reading of the already realized research on that subject one can consult the papers:

E.I.Khukhro,”Fitting height of a finite group with a Frobenius group of automorphisms”, J. Algebra 366, (2012), 1-11

G.Ercan,İ.S.Güloglu,”*Action of a Frobenius-like group*”, J. Algebra 402 (2014), 533-543

G.Ercan,İ.S.Güloglu, “*Action of a Frobenius-like group with fixed-point-free kernel*”,J.Group Theory 17 (2014),863-873

G.Ercan,İ.S.Güloglu,E.I.Khukhro”*Rank and order of a finite group admitting a Frobenius-like group of automorphisms”,* Algebra and Logic 53 (2014), 258-263

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 ***Pavel Shumyatsky****, On the length of a finite group.* Every finite group G has a normal series each of whose factors either is soluble or is a direct product of nonabelian simple groups. The nonsoluble length of G  is defined as the minimum number of nonsoluble factors in a series of this kind. Upper bounds for the nonsoluble length appear in the study of various problems on finite, residually finite, and profinite groups. In particular, such bounds played important role in the Hall-Higman reduction theorem for the restricted Burnside problem. In the talk several new results on nonsoluble length will be discussed. Most of the results were obtained during recent collaboration with Khukhro.