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Institut Universitari de Matemàtiques i Aplicacions de Castelló
Universitat Jaume I

Institut de Matemàtiques i Aplicacions de Castelló (IMAC)
UNIVERSITAT JAUME·I

Jornada IMAC sobre Grupos y Grupos Topológicos

Universitat Jaume I

IMAC, TI1329DS, 25 de marzo de 2015

Programa:

•11:30 María José Felipe (Universitat Politècnica de València):

Conjugacy classes contained in a normal subgroup

Abstract.
It is known that the structure of a finite group is strongly controlled by the set of its conjugacy class sizes. Let G be a finite group and N a normal subgroup of G. Since N is union of conjugacy classes of G, it is natural to wonder what information on the structure of N can be obtained from the G-classes of N, that is, the conjugacy classes in G contained in N. We would like to point out that the set of primes dividing the G-class sizes of N is not necessarily contained in the set of primes dividing the order of N and that there is no relation between the cardinal of the set of the conjugacy class sizes of N and the cardinal of the set of its G-class sizes. However, several results have put forward that the G-class sizes, or even the G-class sizes of certain subsets of elements of a normal N, such as the p'-elements for some prime p or the prime-power order elements, also influence on its structure. We present some recent researches concerning to this new topic.

•12:30 Dmitri Shakhmatov (Ehime University, Matsuyama, Japan):

On the existence of connected Hausdorff group topologies on abelian groups

Abstract.
It is easy to see that a non-trivial connected Hausdorff group must have cardinality at least continuum. Seventy years ago Markov asked if every group of cardinality at least continuum can be equipped with a connected Hausdorff group topology. Twenty five years ago a counter-example to Markov's conjecture was found by Pestov, and a bit later Remus showed that no permutation group admits a connected Hausdorff group topology. The question (explicitly asked by Remus) whether the answer to Markov's question is positive for abelian groups remained widely open. We prove that every abelian group of cardinality at least continuum has a connected Hausdorff group topology, Furthermore, we give a complete characterization of abelian groups which admit a connected Hausdorff group topology having compact completion.

This is a joint work with Dikran Dikranjan (Udine University, Italy).

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