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## MATHEMATICS DEPARTMENT 25TH YEAR SEMINARS

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### Good Action

Gülin Ercan

Middle East Technical University

**Abstract:** Let  $G$  be a group acted on by a group  $A$  by automorphisms. The nature of this action is very restrictive and hence informative about the structure of  $G$ . We have been carrying on research in this area, especially on length type problems, in several collaborated works over the years. The action is said to be coprime if  $G$  and  $A$  have coprime orders. The existence of nice conditions which are valid in this case made it almost traditional to assume that the action is coprime. After many attacks to a longstanding noncoprime conjecture we have recently introduced the concept of a good action of  $A$  on  $G$  in a joint work with Gülođlu and Jabara. We say the action is “good” if  $H = [H, B]C_H(B)$  for every subgroup  $B$  of  $A$  and for every  $B$ -invariant subgroup  $H$  of  $G$ . It can be regarded as a generalization of the coprime action due to the fact that every coprime action is good and there are noncoprime actions which are good. It is expected that this concept may help to understand the real difficulties in studying a noncoprime action. We have achieved extending several coprime results to good action case. With this talk I aim to present a review of our results and discuss the main difficulties that arise in the study of a noncoprime good action.

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**Date:** December 17, 2021; Friday

**Time:** 16:00

**Place:** Zoom



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