

THEORY OF GROUPS, MATH 213A

RAPHAËL ROUQUIER

Fall 2018

MWF 9-9:50am, MS 7608

This course will discuss some topics in group theory.

We will review general constructions and properties and analyze in more depths various classes of groups: finite groups, Lie-type groups, and groups related to discrete geometry and topology. We will also bring in some basic representation theory along the way. One particular theme will be the use of certain classes of subgroups to control properties of a group: local subgroups for finite groups, parabolic subgroups for groups of Lie type.

Topics to be discussed:

- Chevalley groups, BN pairs, buildings
- Finite groups, local structure, classification of finite simple groups
- Presentations of groups
- Symmetric groups, Coxeter groups

References

M. Aschbacher, Finite group theory

D.J.S. Robinson, A course in the theory of groups

Office hours: by appointment

Projects

The course assessment will be based on a 20mn presentation of an assigned project. The presentations will be held during the week December 3–7. A list of possible projects will be provided on Monday October 29 and a preferred choice, as well as a second and third choice, will need to be sent to me by email by Wednesday October 31. An abstract of what you plan to do for the presentation will be due on Wednesday November 14. You may also suggest your own topic, which I will need to approve.