

**Title:** Generation properties in finite groups: Tools and applications

**Abstract:** A well-developed branch of finite group theory compares different invariants in certain classes of finite groups. For example, one may take certain classes of permutation groups  $G$ , of degree  $n$ , and ask: How big can  $|G|$  be, in terms of  $n$ ? How many generators will  $G$  need in terms of  $n$ ? If one chooses generators of  $G$  at random, with replacement, then how long will it take before a generating set is found? In this talk, we will study these questions in various different classes of finite groups, from permutation and linear groups to simple groups and their subgroups. We will also outline some useful techniques, and some interesting applications to enumeration problems in graph theory.