

PERMUTATION GROUPS AND COHERENT CONFIGURATIONS

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Starting in the late 1960s, the theory of coherent configurations has now become one of the central parts of algebraic combinatorics. The main goal of this theory is to provide a common method to study symmetries of combinatorial objects. So it is not surprising that permutation groups provide a rich source of coherent configurations. In fact, there is a natural Galois correspondence between subgroups of symmetric group on a set Ω and coherent configurations defined on Ω . The closed objects with respect to that correspondence are *2-closed* permutation groups and *schurian* coherent configurations. In our talk, we will discuss these notions from various points of view: algebraic, combinatorial, algorithmic. We will also address the question how one can effectively solve the following problems.

2-Closure Problem. *Given a permutation group on a finite set, find the 2-closure of it.*

Schurity Problem. *Given a coherent configuration on a finite set, determine whether or not it is schurian, and if so, find a permutation group associated with it.*

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