# Artin-Tits groups

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The course is devoted to some combinatorial properties of Artin braid groups and their generalizations: Artin-Tits groups, Garside groups. The following topics will be addressed:

1. Monoids and groups defined by a presentation: the word reversing method; example of Artin (standard and dual) presentations;

2. Garside groups: lattice of divisibility, recognizability, normal form, isoperimetric inequality, automatic structure; example of Artin-Tits groups;

3. Braid groups: geometric realizations, connection with knots; colourings and self-distributive operations; canonical ordering; characterization in terms of trees;

4. Braid groups: handle reduction, description and convergence; Dynnikov's formulas.

Most parts of the course are covered in the survey text *Why are braids orderable?* by Dehornoy, Dynnikov, Rolfsen, Wiest, *Panoramas & syntheses* vol. 14, **Soc. Math. France** (2002), and in the lectures notes about Artin-Tits groups by François Digne,
`http://www.mathinfo.u-picardie.fr/digne/poly_tresses.pdf`
Hopefully specific lecture notes will be ready at the time of the Summer School.

The course has very few prerequisites: some familiarity with monoids and groups defined by presentations could be helpful; a good source is the first chapters of Epstein's book *Word processing on groups*, Jones & Barlett (1992).