

## Symmetric groups, combinatorics and characters 2010

### Projects, week 8-9

Each participant should prepare the presentation of one of the following projects in week 9 of the course (12.-14. april). The presentation has a *written and an oral part*.

The *written part* should be a survey of the subject of the project, presenting the important results. It should be readable by the other participants of the course and comprise 1-3 pages. For the joint projects only one (longer) survey is required. Deadline for submission of the written parts is Friday 9. april at 3 pm.

The *oral part* of the presentation should last between 20 and 30 minutes for each participant.

Here are the **projects**. The necessary literature is available in Absalon.

**Project 1 and 2:** *Descents in permutations, Eulerian numbers* (Based on chapter 1 in the book M. Bona: Combinatorics of permutations)

**Project 3 and 4:** *Partition sequences and hooks* (Based on chapter 2 in [LN] and on the paper "On Hooks of Young Diagrams" by C.Bessenrodt)

**Project 5:** *Bar partitions* (Based on chapter 4 in [LN])

**Project 6:** *Lusztig symbols* (Based on chapter 5 in [LN])

**Project 7:** *The hook formula* (Based on the paper "An elementary proof of the hook formula" by J. Bandlow)

**Project 8 and 9:** *Two-variable generating functions, Gaussian polynomials, Euler's triple product identity* (Based on [AE], 5.3, 7.1-7.3, 8.3 and the paper "A combinatorial proof of the triple product identity" by R. Lewis)