Schedule Darstellungstheorietage 2024

All lectures and coffee in Room 8.122 (building V57).

Thursday 13 February.

    13:00 - 14:00: *Welcome coffee*
    14:00 - 14:30: Eirini Chavli
    14:40 - 15:20: Patrick Serwene
    15:30 - 16:15: *Coffee break*
    16:15 - 16:45: Gunter Malle
    18:00 - ?: *Joint dinner* at www.looss-kulinarisches.de/marktstueble

Friday 14 February.

    09:30 - 10:00: Thomas Breuer
    10:10 - 10:50: Caroline Lassueur
    11:00 - 11:30: *Coffee break*
    11:30 - 12:10: Britta Späth — cancelled
    12:20 - 12:50: Frank Lübeck

Titles/abstracts:

- Eirini Chavli (Stuttgart)
  Title: Nakayama algebras via combinatorics
  Abstract: Nakayama algebras appear naturally in modular representation theory of groups. In this talk we will explain the connection of these algebras with two combinatorial objects: the 321-avoiding permutations and the Dyck paths. We will use these objects to explain the representation theory and homological algebra of Nakayama algebras (joint work with René Marczinzik).
- Patrick Serwene (Dresden)
  Title: Applications of Fusion Systems in Block Theory
  Abstract: Fusion systems arise from both finite groups and finite group blocks. A conjecture suggests the equivalence of these construction approaches. We explore the conjecture's implications in Block Theory and discuss the broader applications of fusion systems, particularly in addressing key conjectures within this field.
- Gunter Malle (Kaiserslautern)
  Title: Decomposition numbers and Sylow normalisers
  Abstract: We investigate the relationship between the p-modular decomposition numbers of characters of height zero in the principal p-block of a finite group G and the p-local structure of G. This is joint work with Noelia Rizo.
- Thomas Breuer (Aachen)
  Title: On rich subgroups in finite groups
  Abstract: A proper subgroup H of a group G is called *rich* in G if $[\chi_H, 1_H] \neq 0$ holds for all $\chi \in \mathrm{Irr}(G)$. We investigate which groups G have nontrivial rich subgroups H, and study

relations to the Frobenius graph of (G, H) and to the total degree of G. This is joint work with L. Héthelyi, E. Horváth, B. Külshammer, M. Szőke.

- Britta Späth (Wuppertal)

  Title: The Alperin-McKay Conjecture for blocks with maximal defect

  Abstract: For blocks of maximal defect the Alperin-McKay conjecture can be seen as a blockwise refinement of the McKay conjecture. Some of the techniques and results used in proving the McKay conjecture help in the context, other need some refinement. I will explain what additional block-theoretic problems arise in this situation and how they can be solved using Dade's ramification groups. This is joint work with Lucas Ruhstorfer.

- Caroline Lassueur (Hannover)

  Title: On the source algebra equivalence class of cyclic blocks

  Abstract: A wide-open question in the representation theory of finite groups is to know which algebras can occur as blocks of group algebras. Donovan's and Puig's conjectures predict a finite number up to Morita/source-algebra equivalence if a defect group is fixed, up to isomorphism. Classifying the equivalence classes is an even more involved task. Given an odd prime number p, we explain how the source-algebra equivalence class of a p-block with non-trivial cyclic defect groups can be read off from the values of the ordinary characters of the block at the p-elements of the group. Moreover, one parameter coming into play is an endo-permutation module over a defect group. We classify this invariant for several classes of quasi-simple groups. This is joint work with G. Hiss.

- Frank Lübeck (Aachen)

  Title: Computing generalized Green functions

  Abstract: Green functions play an important role in the description of values of Deligne-Lusztig characters for finite groups of Lie type. In general further class functions are needed for the full character tables of these groups, and generalized Green functions are needed for those. Lusztig (1985) described an algorithm for computing the generalized Green functions up to certain scalars and Shoji has determined these scalars in many cases. In recent work these scalars were now determined in the remaining cases. Part of this is joint work with T. Shoji.