Darstellungstheorietage 2025

Heinrich-Heine-Universität Düsseldorf

13-14 November 2025

Thursday 13 November 2025

The talks will take place in Lecture Hall **25.11.HS 5C**.

13:00 - 14:05	Registration, coffee/tea (room **25.22.00.53**)
14:10 - 14:15	Welcome and practical matters
14:15 - 15:05	**Ramla Abdellatif** (Amiens)
	An Introduction to p-modular representations of p-adic groups
15:10 - 15:40	Coffee/tea break
15:40 - 16:20	**Ramla Abdellatif** (Amiens)
	p-modular Iwahori-Hecke algebras and their simple modules for the p-adic metaplectic $\widetilde{\mathrm{SL}}_2(F)$
16:30 - 17:00	**Erik Barinaga** (Wuppertal)
	Chow groups of Deligne–Lusztig varieties
17:10 - 18:00	**Charles Eaton** (Manchester)
	A survey of progress on Donovan's conjecture
19:30	Dinner (optional) at Cafe Weise an der Uni or Sen Vegan Cuisine

Friday 14 November 2025

The talks will take place in Lecture Hall **25.11.HS 5E**.

8:30 - 8:55	Coffee/tea (room **25.22.00.53**)
9:00 - 9:50	**Eugenio Giannelli** (Firenze)
	McKay bijections and characters degrees
10:00 - 10:30	**Pavel Turek** (Birmingham)
	Decomposition columns labelled by d balanced partitions
10:30 - 11:00	Coffee/tea break
11:00 - 11:30	**Tommaso Scognamiglio** (Bologna)
	Multiplicities for finite reductive groups and character varieties for Riemann surfaces
11:35 - 12:05	**Ziqian Yin** (Wuppertal)
	Mod p local Langlands correspondence
12:05 - 12:25	Coffee/tea break
12:30 - 13:10	**Britta Späth** (Wuppertal)
	Towards the Alperin-McKay Conjecture

Ramla Abdellatif I (Université de Picardie Jules Verne): *An introduction to p-modular representations of p-adic groups*

This talk aims at introducing the context and motivation of my primary research topic, namely p-modular representations of p-adic groups, as well as a current state of art of the domain, including some related questions I am currently interested in. After motivating the study of classical and modular Langlands correspondences for p-adic groups, I will explain why the p-modular setting (i.e. when representations of p-adic groups have coefficients in a field of positive characteristic equal to p) is so different than the other settings (namely the complex and ℓ-modular ones, with ℓ a prime different from p), then present the main results known so far about p-modular irreducible smooth representations of p-adic groups, with a special focus on the special linear group SL_2.

Ramla Abdellatif II (Université de Picardie Jules Verne): *p-modular Iwahori-Hecke algebras and their simple modules for the p-adic metaplectic $\widetilde{\mathrm{SL}}_2(F)$*

Let p be a prime integer, let F be a non-Archimedean local field of residual characteristic p, such as the field $\mathbb{Q}_p$ of p-adic numbers and let C be an algebraically closed field. In the second half of the past century, Hecke algebras of metaplectic groups and their representation theory have been studied in the setting of Shimura and Theta correspondences. When C is the field of complex numbers, a lot is known for $\widetilde{\mathrm{SL}}_2(F)$, but things get much more mysterious when C is of positive characteristic $\ell > 0$. Assuming $\ell \neq p$ allows to transfer some of the complex statements to the ℓ-modular framework, but all collapses when $\ell = p$. In this case (called the *p-modular case*), very little is known about the Hecke algebras associated with $\widetilde{\mathrm{SL}}_2(F)$, and basically nothing was done so far regarding the correspondences aforementioned.

In this talk, I will discuss some joint work with Soma Purkait (Institute of Science Tokyo) in the p-modular case. In this setting, we provide a description of the p-modular Iwahori-Hecke algebras associated with the p-adic metaplectic group $\widetilde{\mathrm{SL}}_2(F)$ and of their simple modules. If time allows it, I will explain how our results compare with what is known for $\mathrm{GL}_2(F)$ (Vignéras) and $\mathrm{SL}_2(F)$ (myself), as well as how they connect to the p-modular representation theory of $\widetilde{\mathrm{SL}}_2(F)$, in the view of a (for now conjectural) p-modular Langlands correspondence for this group.

Erik Barinaga (Bergische Universität Wuppertal): *On Chow groups of Deligne–Lusztig varieties*

Deligne–Lusztig varieties play a very important role in the representation theory of finite groups of Lie type, as covered in the landmark 1976 paper by Deligne and Lusztig. Nevertheless, these schemes remain mysterious in general. For instance, as of yet we have no real strategy to determine their ℓ-adic cohomology groups in a coherent way, especially outside of the general linear case, or small rank examples. Likewise, not much is known about their Picard groups or more general (higher) Chow groups. In this talk, we will present some results on (rational, higher) Chow groups of Deligne–Lusztig varieties. We discuss a recursive formula describing the rational Picard group of a Deligne–Lusztig variety in terms of a smaller variety in the case of $G = \mathrm{Gl}_n$. This is work in progress, and part of my PhD thesis.

Charles Eaton (University of Manchester): *A survey of progress on Donovan's conjecture*

Donovan's conjecture concerns module categories of blocks of finite groups, and predicts that there are only finitely many Morita equivalence classes amongst blocks with any given isomorphism type of defect groups. It is possible to apply the classification of finite simple groups to the conjecture, and there has been some success, especially where the defect groups are abelian. I will survey progress on the conjecture, and the related problem of classifying Morita equivalence classes.

Eugenio Gianelli (Università degli Studi di Firenze): *McKay bijections and character degrees*

The McKay conjecture has been a central problem in the representation theory of finite groups for over 60 years. A complete proof was only recently achieved through the work of Cabanes and Späth. In this talk, I will present a new refinement of the McKay conjecture and outline its proof for the class of symmetric groups.

Pavel Turel (University of Birmingham): *Decomposition columns labelled by d-balanced partitions*

A central open problem of the modular representation theory of symmetric groups (and Hecke algebras) is the computation of decomposition numbers, which describe decompositions of Specht modules in prime characteristic. These numbers are organised in a decomposition matrix, the structure of which remains a mystery. In this talk, we present new results about columns of this matrix labelled by a novel family of partitions called d-balanced partitions, describing many of these columns explicitly. It turns out that these columns have a rich combinatorial structure, which will be explored during the talk and may be of independent interest. This is joint work with David Hemmer and with Bim Gustavsson and Stacey Law.

Tommaso Scognamiglio (INdAM, Università di Bologna): *Multiplicities for finite reductive groups and character varieties for Riemann surfaces*

The representation theory of the finite group $\mathrm{GL}_n(\mathbb{F}_q)$ is well understood, thanks to its combinatorial description (given by Green) and its geometric interpretation due to the results of Deligne and Lusztig. Still, we have very little understanding of the multiplicities, i.e. of the decomposition of tensor product of irreducible representations. Hausel, Letellier and Rodriguez-Villegas gave a combinatorial description of the multiplicities in the generic case. This description relates these multiplicities to the cohomology of complex character varieties for $\mathrm{GL}_n(\mathbb{C})$. In a joint work with Emmanuel Letellier, we try to generalize these results to other groups of type A. In particular, we study multiplicities for characteristic functions of character sheaves of $\mathrm{SL}_n(\mathbb{F}_q)$, rather than irreducible characters, and relate them to the cohomology of complex character varieties for $\mathrm{PGL}_n(\mathbb{C})$. We expect more generally that, for a finite reductive $G(\mathbb{F}_q)$, multiplicities should be related to the character varieties for its complex Langlands dual.

Ziqian Yin (Bergische Universität Wuppertal): *Mod p local Langlands correspondence*

Given p a prime number, F a finite unramified extension of $\mathbb{Q}_p$ and k any algebraically closed field. As a corollary, Local Class Field Theory tells us how certain one-dimensional k-representations of the absolute Galois group G_F are closely related to certain k-representations of $\mathrm{GL}_1(F)$. The Mod p Local Langlands Correspondence suggests to generalize this phenomenon to higher dimensions (and even to other reductive groups) when $\mathrm{char}(k) = p$. In this talk, we would like to briefly describe the correspondence for $\mathrm{GL}_2(\mathbb{Q}_p)$ (due to C. Breuil) and a parallel bijection using simple pro-p Iwahori–Hecke modules (due to M.-F. Vignéras), and then discuss how the case of SL_2 behaves differently.

Britta Späth (Bergische Universität Wuppertal): *Towards the Alperin-McKay Conjecture*

The Alperin–McKay conjecture may be regarded as a blockwise refinement of the McKay conjecture. While several techniques and results developed in the verification of the McKay conjecture remain applicable in this broader context, others require substantial modification and refinement. This talk will present two recent advances towards establishing the Alperin–McKay conjecture. The first concerns the verification for blocks of maximal defect, obtained in joint work with Lucas Ruhstorfer. The second pertains to recent progress by Gaëtan Mancini, who has verified the inductive conditions for various blocks of quasi-simple groups of exceptional type.