Abstracts

Charlotte Chan (University of Michigan)

Generic character sheaves for parahoric subgroups

Abstract: Lusztig's theory of character sheaves for connected reductive groups is one of the most important developments in representation theory in the last few decades. In this talk, we will describe a construction which extends this "depth zero" picture to give positive-depth character sheaves associated to generic data. In the simplest nontrivial case, this resolves a conjecture of Lusztig and produces perverse sheaves associated to sufficiently generic multiplicative local systems whose trace-of-Frobenius function coincides with parahoric Deligne–Lusztig induction. This is joint work with R. Bezrukavnikov.

Gabriel Dospinescu (UMPA ENS de Lyon)

One-dimensional mod p quaternionic representations

Abstract: I will explain how the recent six functor formalism of Lucas Mann together with finiteness results of Scholze imply some rather concrete vanishing and finiteness properties for the mod p cohomology of the Lubin-Tate and Drinfeld spaces in dimension 1, and related results for Hecke eigenspaces in mod p cohomology of quaternionic Shimura curves ramified at p. This is joint work (in progress...) with Juan Esteban Rodríguez Camargo.

Andrea Dotto (University of Chicago)

Some consequences of mod p multiplicity one for Shimura curves

Abstract: The multiplicity of Hecke eigenspaces in the mod p cohomology of Shimura curves is a classical invariant, which has been computed in significant generality when the group is split at p. This talk will focus on the complementary case of nonsplit quaternion algebras, and will describe a new multiplicity one result, as well as some of its consequences regarding the structure of completed cohomology. I will also discuss applications towards the categorical mod p Langlands correspondence

for the nonsplit inner form of $GL_2(Q_p)$. Part of the talk will comprise a joint work in progress with Bao Le Hung.

Tony Feng (Berkeley University)

A new approach to Breuil-Mezard cycles

Abstract: The Breuil-Mezard Conjecture predicts the existence of hypothetical 'Breuil-Mezard cycles' in the moduli space of mod p Galois representations of Q_p that should govern congruences between mod p automorphic forms on a reductive group G. For $G = GL_2$, it is closely related to the weight part of Serre's Conjectures. Thus far the most general progress on the Breuil-Mezard Conjecture has been based on patching, which however has some limitations of global nature. I will talk about joint work with Bao Le Hung on a new approach to the Breuil-Mezard Conjecture for generic parameters. Our method is purely local and group-theoretic; instead of patching, it is based on geometric representation theory and microlocal analysis. In particular, we connect the Breuil-Mezard Conjecture to questions concerning quantum groups and homological mirror symmetry.

Jessica Fintzen (Universität Bonn)

Representations of p-adic groups and Hecke algebras

Abstract: An explicit understanding of the category of all (smooth, complex) representations of p-adic groups provides an important tool in the construction of an explicit or categorical local Langlands correspondence. The category of representations of p-adic groups decomposes into subcategories, called Bernstein blocks, which are indexed by equivalence classes of so called supercuspidal representations of Levi subgroups. In this talk, I will give an overview of what we know about an explicit construction of supercuspidal representations and about the structure of the Bernstein blocks. In particular, I will discuss a joint project in progress with Jeffrey Adler, Manish Mishra and Kazuma Ohara in which we expect to show that general Bernstein blocks are equivalent to much better understood depth-zero Bernstein blocks. This is achieved via an isomorphism of Hecke algebras, as I will explain

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Ian Gleason (Universität Bonn)

Meromorphic vector bundles on the Fargues–Fontaine curve

Abstract: Recent progress in p-adic and perfect geometry has led experts to conjecture a precise categorical (or geometric) version of the local Langlands correspondence. There are mainly two approaches to state the conjecture, one using p-adic geometry and the stack of vector bundles on the Fargues–Fontaine curve and the other one using perfect geometry and the Kottwitz stack parametrizing families of isocrystals. One can ask how do the two conjectures compare. Motivated by this question we introduce and study a third object, the stack of meromorphic vector bundles on the Fargues–Fontaine curve. We provide evidence that this object should "mediate" between the two conjectures. This is joint work in progress with Alex Ivanov.

David Hansen (National University of Singapore)

What can categorical local Langlands do for YOU?

Abstract: I will formulate some conjectures relating the categorical and classical local Langlands correspondences, and discuss what is known about them.

Eugen Hellmann (Universität Münster)

The finite slope part of overconvergent cohomology and coherent sheaves on spaces of Galois representations

Abstract: Overconvergent cohomology of Shimura varieties is a well studied object on the context of (overconvergent) p-adic automorphic forms. The construction of eigenvarieties gives rise to a coherent sheaf on a rigid analytic space whose cohomology can be identified with (the dual of) the finite slope part of the overconvergent cohomology. I will state a general conjecture how to compute this coherent sheaf in terms of stacks of Galois representations and explain how this conjecture fits into the emerging categorical approach to the p-adic Langlands program. I will also explain joint work in progress with Zhixiang Wu in which we prove the conjecture in the case of the modular curve(s).

David Helm (Imperial College London)

Finiteness for Hecke algebras of p-adic reductive groups

Abstract: Let F be a p-adic field and G a connected reductive group over F. It is a classical theorem of Bernstein that for any compact open subgroup U of G(F), the Hecke algebra $C[U/G(F)/U]$ is Noetherian; in fact its center is a finitely generated C-algebra and the Hecke algebra itself is a finitely generated module over its center. A longstanding and surprisingly difficult problem has been to establish analogous results over coefficient rings other than C, such as ℓ-adic integer rings for ℓ different from p. We explain how the recent results of Fargues-Scholze towards a categorical local Langlands correspondence provide the missing ingredient to resolve this problem.

Ashwin Iyengar (Johns Hopkins University)

Gamma factors for mod ℓ representations of finite general linear groups

Abstract: In the spirit of works going back to Jacquet—Piatetski-Shapiro—Shalika's "Rankin—Selberg convolutions" paper, we construct gamma factors for mod ℓ representations of finite general linear groups and use them to prove a converse theorem in this context. I will explain how the converse theorem fails for a "naïve" notion of gamma factor, and then explain how we can get around this failure by enlarging the rings of coefficients in which our upgraded gamma factors take values. I will also discuss the relationship to recent work of Li—Shotton which addresses a finite field analogue of "local Langlands in families". This is joint work with J. Bakeberg, M. Gerbelli-Gauthier, G. Moss, H. Goodson, and R. Zhang.

Tasho Kaletha (University of Michigan)

A local Langlands conjecture for disconnected groups

Abstract: Langlands' conjectures are usually phrased in the setting of connected reductive groups. In this talk we will explore a generalization of the statement of the local conjectures to the setting of disconnected groups, subject to a certain mild restriction. Proving these conjectures in the simplest case – that of a disconnected group whose identity component is a torus – already shows an interesting new phenomenon. Time permitting, we will mention an application to the reduction of the refined local Langlands correspondence, both for connected and disconnected groups, to the case of discrete parameters.

Brandon Levin (Rice University)

The weight part of Serre's conjecture and the Emerton-Gee stack

Abstract: The Breuil-Mezard conjecture predicts the geometry of local deformation rings with p-adic Hodge theory conditions in terms of modular representation theory. I will describe a version of this conjecture on the Emerton-Gee moduli stack of mod p Galois representations and its connection with the weight part of Serre's conjecture. I will then discuss joint work with Daniel Le, Bao V. Le Hung, and Stefano Morra on both these conjectures for certain classes of potentially crystalline substacks.

João Lourenço (WWU Münster)

Towards Bezrukavnikov via p-adic central sheaves

Abstract: In the 80s Kazhdan–Lusztig computed the equivariant coherent Grothendieck group of the Steinberg variety, which identifies with the equivariant étale Grothendieck group of the corresponding affine flag variety in equicharacteristic. A decade ago, Bezrukavnikov upgraded this isomorphism to an equivalence of derived categories of sheaves, building on the central sheaves constructed by Gaitsgory and his work with Arkhipov on the anti-spherical realization. Joint with J. Anschütz, I. Gleason, and T. Richarz, we constructed central sheaves inside the Witt vector affine flag variety in terms of perfectoid nearby cycles. We will explain joint progress with J. Anschütz, Z. Wu, and J. Yu towards writing down an Arkhipov–Bezrukavnikov equivalence building on those p-adic central sheaves.

Lucas Mann (Universität Münster)

Representation Theory via 6-Functor Formalisms

Abstract: We present recent advances on the abstract theory of 6-functor formalisms and apply them to the representation theory of locally profinite groups. This sheds new light on classical results like preservation of admissibility under various operations, Bernstein-Zelevinsky duality and Second Adjointness. As an application we obtain new results on the p-adic representation theory of p-adic Lie groups.

Wieslawa Niziol (CNRS/Sorbonne University)

Duality in p-adic pro-etale cohomology of analytic curves

Abstract: I will discuss duality theorems in p-adic pro-etale cohomology of analytic curves. This is joint work with Pierre Colmez and Sally Gilles.

Juan Esteban Rodriguez Camargo (MPIM Bonn)

A local Jacquet-Langlands correspondence for locally analytic D-modules

Abstract: In this talk I will explain an equivalence between the categories of locally analytic $GL_2(F)$-equivariant D-modules over the Drinfeld space, and the locally analytic $D^{\check{*}}$-equivariant D-modules over $\mathbb{P}^1$ from the Lubin-Tate side. As an application, we prove that the locally analytic version of the functor of Scholze preserves admissible locally analytic representations. This is joint work in progress with Gabriel Dospinescu.

Eva Viehmann (Universität Münster)

Admissibility and weak admissibility

Abstract: I will give an overview of the relation between the weakly admissible locus and the admissible locus, and of the associated Harder-Narasimhan stratification resp. Newton stratification of the B_dR$\hat{+}$-affine Grassmannian.

Marie-France Vigneras (Université de Paris)

Representations of $GL_n(D)$ near the identity

Abstract: For mod p irreducible admissible representations π of $G = GL_2(Q_p)$, parahoric subgroups $\mathfrak{k}^*$ of G of congruence subgroups $K_j = 1 + p^j \mathfrak{k}, j \geq 1$, Morra (2013) proved that $\dim \pi^{K_j} = a + bp^j$ with two explicit integers a, b. I will explain that a similar result holds true for the representations of the inner forms of the general linear groups over a finite extension of Q_p or of $F_p((t))$, when the coefficient field has characteristic $\neq p$. This is common work with Guy Henniart (2023)..