

Lundi 30 juin

9h30 - 10h30 Gabriel Dospinescu (ENS Lyon)

"p-adic Langlands for $\mathrm{GL}_2(\mathbb{Q}_p)$ when p is at most 3"

Résumé : "I will try to explain some steps in the proof of the classification theorem for irreducible admissible unitary Banach space representations of $\mathrm{GL}_2(\mathbb{Q}_p)$, proof which covers all primes p (the case $p > 3$ being known by work of Paskunas). This is joint work with Pierre Colmez and Vytutas Paskunas."

11h - 12h Florian Herzig (Université Toronto)

"On mod p local-global compatibility for GL_3 in the ordinary case"

Résumé : "Suppose that $\bar{\rho} : G_{\mathbb{Q}_p} \rightarrow \mathrm{GL}_3(\bar{\mathbb{F}}_p)$ is a maximally nonsplit, ordinary, Fontaine-Laffaille Galois representation. Then its "extension class" is determined by an invariant in $\bar{\mathbb{F}}_p$. In a global situation, under suitable hypotheses, we show that this invariant can be calculated using $\mathrm{GL}_3(\mathbb{Q}_p)$ -representation theory. On the way we prove some new results about the Serre weights of ρ_{bar} . This is joint work with Stefano Morra."

16h- 17h Stefan Patrikis (MIT)

"Generalized Kuga-Satake theory and rigid local systems"

Résumé : "A classical construction in complex algebraic geometry, due to Kuga and Satake, associates to any K3 surface an abelian variety, with a precise relationship between their Hodge structures. This relies essentially on the fact that we can recognize the Hodge structures associated to abelian varieties. I will explain how to produce some special cases of a 'generalized Kuga-Satake theory'—a very general conjecture about 'lifting' motivic Galois representations—using geometric Langlands theory. Notably, these examples will not arise from motives generated by abelian varieties. Time permitting, I will also discuss an auxiliary result, that motivated motives (in the sense of Y. André) underlie the weight-gradings of intersection cohomology."

17h30 - 18h30 Eugen Hellmann (Université Bonn)

"Eigenvarieties, spaces of trianguline representations and patching"

Résumé : "Using a patching module without fixed level structure at primes dividing p (as in recent work of Caraiani, Emerton, Gee, Geraghty, Paskunas and Shin) one can construct some analogue of an eigenvariety. We show that this "patched" eigenvariety agrees (up to taking a product with some open polydisc) with a union of irreducible components of a space of trianguline representations. This has some consequences for eigenvarieties for unitary groups as well as some applications to Breuil's recent work on the locally analytic socle of some GL_n representations. This is joint work with C. Breuil and B. Schraen."

Mardi

9h - 10h Jared Weinstein (Université Boston)

"Local Shimura varieties for p -adic fields"

Résumé : "We report on progress towards a theory of local Shimura varieties for p -adic fields, in parallel with the theory of local shtukas for $\mathbb{F}_q((t))$. Using perfectoid spaces (in particular Scholze's theory of "diamonds"), it is possible to give a unified definition of local shtukas which incorporates both the equal and unequal characteristic cases. Conjecturally, if G is a reductive group, the cohomology of a moduli space of local G -shtukas should realize the Langlands correspondence for G in a systematic way (along the lines described by V. Lafforgue for global shtukas). This talk will draw heavily from ideas of Peter Scholze and Laurent Fargues."

10h15 - 11h15 Jan Kolhase (Université Essen)

"Smooth duality in natural characteristic"

Résumé : "Let G be a p -adic Lie group and let E be a field of characteristic p . On the category of E -linear smooth G -representations the smooth duality functor is known to be rather ill-behaved. In contrast to the classical theory it is not exact and has a large kernel. We explain how its derived functors can be interpreted in terms of the Auslander duality of completed group rings. When G is a p -adic reductive group we compute these derived functors in a large class of examples and discuss the dimension theory of admissible smooth representations of G over E ."

11h30 - 12h30 Benoît Stroh (CNRS/Univ. Paris 13)

"Cycles proches et fonctions centrales des algèbres de Hecke"

Résumé : "Dans ce travail en collaboration avec Tom Haines, nous étendons la thèse de Gaitsgory du cas des structures de niveau $\Gamma_0(p)$ à celui des structures de niveau $\Gamma_1(p)$. Il s'agit donc de construire certaines dégénérescences modelées sur la mauvaise réduction de variétés de Shimura de telle manière que leurs cycles proches définissent des fonctions centrales dans certaines algèbres de Hecke via le dictionnaire faisceau-fonction de Grothendieck."

16h - 17h Pascal Boyer (Université Paris 13)

"La cohomologie des espaces de Lubin-Tate est sans torsion"

Résumé : "Nous définirons dans un cadre général, la notion de filtrations de stratification d'un faisceau pervers « libre ». Dans le cas du faisceau pervers des cycles évanescents d'une variété de Shimura de Harris-Taylor-Kottwitz, l'absence de torsion dans la cohomologie des espaces de Lubin-Tate est équivalente à une propriété dite de « saturation » d'une telle filtration de stratification. Nous donnerons les étapes principales de la preuve de cette propriété."

17h30 - 18h30 Jack Thorne (Université Harvard)

"Congruences between automorphic forms"

Résumé : "In the 1980's, Ribet showed how to construct congruences between holomorphic newforms on $GL(2)$ by level-raising. The obstruction to generalizing these arguments to higher-rank groups is what usually goes by the name 'Ihara's lemma'. We will discuss how to relate this problem to the vanishing of torsion in the cohomology of Shimura varieties, and prove a level-raising result for definite unitary groups."

Mercredi

9h30 - 10h30 Peter Scholze (Université Bonn)

"p-adic cohomology of the Lubin-Tate tower"

Résumé : "We prove a finiteness result on the p -adic cohomology of the Lubin-Tate tower, which allows one to go from mod p and p -adic $\mathrm{GL}_n(\mathbb{F})$ -representations to Galois representations (compatibly with some global correspondences)."

11h - 12h Fabrizio Andreatta (Université Milan)

"On the crystalline comparison morphism for almost ordinary p -divisible groups."

Résumé : "In collaboration with A. Iovita we showed how the usual Hodge-Tate sequence for p -divisible groups, admitting canonical subgroup, can be modified into an exact sequence. The key ingredient is the construction of a new integral structure on the invariant differentials. I will explain how to lift such structures providing integral versions of crystalline comparison morphisms. Applications will be given."

Jeudi

9h30 - 10h30 Haruzo Hida (UCLA)

" p -rigidity and Iwasawa μ -invariants."

Résumé : "We can expand each mod p Hilbert modular form f into a t -expansion $f(t_{\mathfrak{P}})_{\mathfrak{P}|p}$ by Serre-Tate coordinates $\{t_{\mathfrak{P}}\}_{\mathfrak{P}|p}$ for $\mathfrak{P}$ running over primes over p in the base totally real field. We prove $f = 0$ if $f_{t_{\mathfrak{P}'}=1} = 0$ for all $\mathfrak{P}'$ not equal to a fixed factor $\mathfrak{P}$. Then we discuss its application to Iwasawa μ -invariants. This is a joint work with Ashay Burungale."

11h - 12h Jan Nekovar (IMJ)

"Semi-simplicity of the Galois action on étale cohomology of quaternionic Shimura varieties"

16h - 17h Frank Calegari (Université Northwestern)

"Modularity Lifting Beyond the Taylor-Wiles Method"

Résumé : "We prove new modularity lifting theorems for p -adic Galois representations in situations where the methods of Wiles and Taylor-Wiles"

do not apply. Previous generalizations of these methods have been restricted to situations where the automorphic forms in question contribute to a single degree of cohomology. In practice, this imposes several restrictions? one must be in a Shimura variety setting and the automorphic forms must be of regular weight at infinity. In this paper, we essentially show how to remove these restrictions. This is joint work with D. Geraghty.”

17h30 - 18h30 Ana Caraiani (Université Princeton)

”On the image of complex conjugation in certain Galois representations”

Résumé :”Harris-Lan-Taylor-Thorne and Scholze construct Galois representations associated to regular algebraic, cuspidal automorphic representations and to torsion classes in the cohomology of locally symmetric spaces for GL_n over a CM field. In the case of a totally real field, these Galois representations are expected to be odd, in a sense we will make precise. We make use of Scholze’s p -adic interpolation techniques to prove this expectation. This is joint work with Bao Le Hung.”

Vendredi

9h - 10h Wiesława Nizioł (CNRS/ENS Lyon)

” p -adic nearby cycles”

Résumé :”I will present a comparison between p -adic nearby cycles and syntomic cohomology sheaves constructed using ϕ -Gamma-modules. This is a joint work with Pierre Colmez.”

10h15 - 11h15 Keerthi Madapusi (Université Harvard)

”The ordinary locus of Shimura varieties of abelian type, with applications to the moduli of K3 surfaces”

Résumé :”We give a natural construction of the Igusa tower over the ordinary locus of the special fiber of a Shimura variety of abelian type at places of good reduction. Ideas of Hida show that this tower has irreducible monodromy under certain weak assumptions. As an application, we use the Kuga-Satake construction to deduce that the moduli of polarized K3 surfaces of fixed degree is geometrically irreducible in odd characteristic.”

11h30 - 12h30 Olivier Taïbi (DMA)

”Calcul de dimensions d’espaces automorphes et modulaires pour les groupes classiques grâce à la formule des traces”

Résumé :”Soit $\mathbf{G}$ un groupe de Chevalley symplectique ou spécial orthogonal. J’expliquerai comment calculer explicitement le côté géométrique de la formule des traces d’Arthur pour une fonction sur $\mathbf{G}(\mathbb{A})$ qui est un pseudo-coefficient *stable* de séries discrètes à la place réelle et l’unité de l’algèbre de Hecke non ramifiée à toute place finie. Grâce aux travaux récents d’Arthur sur la classification endoscopique du spectre automorphe discret de $\mathbf{G}$, on peut analyser finement le côté spectral. Il n’est par exemple pas difficile d’en déduire des formules de dimension pour les espaces de formes modulaires de Siegel à valeurs vectorielles en niveau un. L’ordinateur y parvient au moins jusqu’en genre 7.”