ABSTRACTS

Speaker: Adebisi Agboola
Title: On the arithmetic of special values of p-adic L-functions.
Abstract: I shall discuss the relationship between the arithmetic of a large class of special values of the Katz two-variable p-adic L-function and the structure of certain restricted Selmer groups.

Speaker: Grzegorz Banaszak
Title: Mumford-Tate and Algebraic Sato-Tate groups
Abstract: The purpose of this lecture is the discussion of the Algebraic Sato-Tate group and Algebraic Sato-Tate conjecture for abelian varieties over number fields. The existence of the Algebraic Sato-Tate group over $\mathbb{Q}$ can be applied to define the Sato-Tate group which is useful in search of the precise formulation of the Sato-Tate conjecture for abelian varieties as shown by results of F. Fité, K. Kedlaya, V. Rotger, A. Sutherland. I will explain the relation of the Algebraic Sato-Tate conjecture to Mumford-Tate conjecture. This relation allows one to prove the Algebraic Sato-Tate conjecture for some families of abelian varieties. Examples of such families were considered in the papers on l-adic representations of abelian varieties I wrote jointly with W. Gajda and P. Krasoń. This lecture presents results of a joint paper in progress with Kiran Kedlaya.

Speaker: Tobias Berger
Title: On the similitude theta lift from an orthogonal to a symplectic group
Abstract: I will explain how to adapt the work of Kudla and Millson to obtain a theta lifting of cuspidal cohomology classes for the symmetric space associated to GO(V) for a rational quadratic space V of signature (3,1) to holomorphic Siegel modular forms on GSp(2). One can prove that this lifting is p-integral and that certain Fourier coefficients of the lift are related to L-values. I will also discuss an application (work in progress) to the Bloch-Kato conjecture of the Asai representation.

Speaker: Laurent Berger
Title: Modular representations of $\mathrm{GL}_2(\mathbb{Q}_p)$.
Abstract: The mod p local Langlands correspondence relates some two dimensional representations of $\mathrm{Gal}(\overline{\mathbb{Q}}_p/\mathbb{Q}_p)$ and some modular representations of $\mathrm{GL}_2(\mathbb{Q}_p)$. I will discuss some results revolving around the classification of modular representations of $\mathrm{GL}_2(\mathbb{Q}_p)$ as well as the use of "(φ,Γ)-modules".

Speaker: Gebhard Boeckle
Title: Irreducibility of local versal deformation rings in the (p,p)-case.
Abstract: Let r be a mod p Galois representation of the absolute Galois group of a p-adic local field. The p-adic Galois representations that have r as a reduction are precisely the closed points of the generic fiber X_r of the local versal deformation space of r. Following work of Colmez and Kisin, Nakamura has recently shown the following density result for crystalline representations: Suppose r is two-dimensional and X_r contains a closed smooth point whose associated p-adic representation is crystalline. Then the set of crystalline representations are Zariski dense in the component of X_r containing this point. Thus the crystalline locus inside X_r should be

thought of as a local form of the infinite fern introduced by Gouvea and Mazur. In our talk, we report on joint ongoing work with a A.-K. Juschka. For $p > 2$ and r of dimension 2 we obtain a general result on the irreducibility of X_r. This much extends the applicability of the above result of Nakamura.

Speaker: Pierre Colmez
Title: Representations of $GL_2(\mathbb{Q}_p)$ and (phi, Gamma)-modules
Abstract:

Speaker: Fred Diamond
Title: Reductions of local Galois representations arising from Hilbert modular forms
Abstract: Let F be a totally real field and ρ a two-dimensional mod p Galois representation arising from Hilbert modular forms (or equivalently Shimura curves) over F. The "mod p Langlands philosophy" suggests that the restriction of ρ to a decomposition group at a prime v should be related to the corresponding action of $GL_2(F_v)$, but the precise relation is unclear if F_v is a non-trivial extension of $\mathbb{Q}_p$. I will discuss work with Breuil which makes the relation more precise in the case that F_v is unramified and the restriction is reducible, showing in particular that the extension of characters can often be recovered from the $GL_2(F_v)$-action.

Speaker: Neil Dummigan
Title: A simple trace formula for algebraic modular forms.
Abstract: We shall look at a simple formula for the trace of a Hecke operator, on a space of automorphic forms for a reductive group that is compact at infinity. Applied to the case of the unitary group $U(4)$, this is well-suited to seeking computational evidence for an analogue of Harder's conjecture in which GSp_4 is replaced by $U(2,2)$.

Speaker: Ellen Eischen
Title: An Eisenstein measure for unitary groups
Abstract: One approach to constructing certain p-adic L-functions relies on construction of a p-adic family of Eisenstein series. I will explain how to construct such a family for certain unitary groups. As part of the talk, I will explain how to p-adically interpolate certain values of both holomorphic and non-holomorphic Eisenstein series. I will also mention some applications to number theory and beyond.

Speaker: Wojciech Gajda
Title: On independence of l-adic representations over finitely generated fields
Abstract: Let K be a fin. gen. extension of $\mathbb{Q}$. We consider a family of l-adic representations of the absolute Galois of K (l varies trough rational primes) attached to l-adic cohomology of a separated scheme of finite type over K. We prove that the fields cut out from the alg. closure of K by the kernels of representations of the family are linearly disjoint over a finite extension of K. This settles a question posed by Serre in 1991. If time permits we will also discuss some (related) monodromy calculations for the absolute Galois of K acting on torsion points of abelian variety A over K, and describe some interesting arithmetic applications (e.g., to

the Geyer-Jarden conjecture on torsion on A over large fields). This will be a report on join works with S.Arias-de-Reyna and S.Petersen (preprints available on the arXives).

Speaker: Eknath Ghate
Title: Local semi-simplicity over totally real fields.
Abstract: We show that in a p-adic family of ordinary Hilbert modular forms of parallel weight, all but finitely many arithmetic members of the family have locally totally split Galois representation. The proof is similar to the one given by the speaker and Vatsal when the base field is the field of rational numbers, but had to await certain new modularity theorems for Artin-like representations in the Hilbert modular setting. This is current joint work with Baskar Balasubramanyam.

Speaker: Andrei Jorza
Title: Towards Local-Global Compatibility for $\mathrm{GL}_(2)$ and $\mathrm{GS}_p(4)$.
Abstract: If K is an imaginary quadratic field and π is a regular algebraic cuspidal representation of $\mathrm{GL}(2, \mathbb{A}_K)$ whose central character is a base change from $\mathbb{Q}$ then, by the work of Taylor et al., there exists a Galois representation $\rho_{\pi,p} : G_K \to \mathrm{GL}(2, \overline{\mathbb{Q}}_p)$ which satisfies local-global compatibility "away from p" outside a finite set of primes. We present two results: one is the study of crystallinity at p, obtained using p-adic families and the work of Kisin. The other is local-global compatibility away from p at certain bad places, for which we use our recent result on local-global compatibility for holomorphic Siegel modular forms.

Speaker: Krzysztof Kłosin
Title: Modularity of residually reducible Galois representations
Abstract: We will discuss a recent progress in proving modularity of certain residually reducible (in general n-dimensional) Galois representations over number fields. Concrete applications of our method include proving modularity of some 2-dimensional Galois representations over imaginary quadratic fields and 4- dimensional Galois representations over $\mathbb{Q}$. We will explain the key ideas of the method and possible directions of generalizing it to other situations. This is joint work with Tobias Berger.

Speaker: Piotr Krasoń
Title: On the image of l-adic Galois representations for some classes of abelian varieties
Abstract: We investigate the image of the l-adic representation attached to the Tate module of an abelian variety over a number field with endomorphism algebra of type I, II or III in the Albert classification. We compute the image explicitly and verify the classical conjectures of Mumford-Tate, Hodge, Lang and Tate for a large family of abelian varieties of type I and II. In addition, for this family, we prove an analogue of the open image theorem of Serre. We also prove the Mumford-Tate and Lang conjectures for a wide class of simple abelian varieties of type III. This is a joint work with G. Banaszak and W. Gajda.

Speaker: Jan Nekovar
Title: Some consequences of a formula of Mazur and Rubin for arithmetic local constants.
Abstract: the title is self-explanatory.

Speaker: James Newton
Title: Interpolating the Jacquet-Langlands correspondence - an example of p-adic Langlands functoriality
Abstract: In this talk I will give some examples of p-adic interpolation of Jacquet-Langlands functoriality by studying the completed cohomology of modular curves. The first example of a p-adic interpolation of Jacquet-Langlands functoriality appears in work of Chenevier, who produced a rigid analytic map between the eigencurve for a definite quaternion algebra over $\mathbb{Q}$ and the Coleman-Mazur eigencurve for $\mathrm{GL}_2/\mathbb{Q}$.

Let D be a quaternion algebra over $\mathbb{Q}$, non-split at the infinite place and with discriminant q for some prime $q \neq p$. In this situation there is a rather geometric description of certain cases of the Jacquet-Langlands transfer from automorphic representations of $(D \otimes_{\mathbb{Q}} \mathbb{A}_{\mathbb{Q}})^{\times}$ to automorphic representations of $\mathrm{GL}_2(\mathbb{A}_{\mathbb{Q}})$, arising from the study of the reduction modulo q of a semistable integral model for the modular curve $X_0(q)$ — for example, such a construction appears in Ribet's well-known paper proving the 'ε-conjecture' of Serre. By 'p-adically completing' this construction (using Emerton's completed cohomology), we can then describe a p-adic Jacquet-Langlands correspondence in a geometric way. This also allows us to obtain a map between eigencurves, together with some finer information about the image of such a map than can be obtained by Chenevier's approach.

Speaker: Wiesława Nizioł
Title: Semistable Conjecture - the open case
Abstract: I will sketch a construction of a p-adic period map in the case of varieties having normal crossing compactifications at infinity. The construction uses p-adic regulators from $\log -K$-theory to log-syntomic cohomology.

Speaker: Rene Schoof
Title: Linear forms in logarithms and the modular curve associated to the normalizer of a non-split Cartan subgroup of level 11.
Abstract: Surprise.

Speaker: Ramesh Sreekantan
Title: Higher Chow cycles on Abelian Surfaces
Abstract: In this talk we will discuss the construction of new higher Chow cycles on Abelian surfaces over local fields. The construction use some generalizations of some classical work of Kummer and Humbert, along with some recent work of Birkenhake-Wilhelm and Bogomolov-Hassett-Tschinkel. These new cycles can be applied to prove the analogue of the Hodge-D-conjecture for Abelian surfaces and can also be used to prove some result about torsion of codimensional 2 cycles.

Speaker: Jacques Tilouine
Title: Overconvergent Igusa tower and overconvergent Siegel modular forms (joint work with O. Brinon and A. Mokrane)
Abstract: We construct p-adic families of Siegel forms using a construction based on the notion of overconvergent Igusa tower introduced by Brinon and Mokrane.

Speaker: Yoichi Uetake
Title: Scattering theory for automorphic forms on adele groups
Abstract: We give an algebraic method for constructing a scattering system for automorphic forms on adele groups based on the Eisenstein series. As a byproduct we obtain a spectral interpretation for (Langlands) automorphic L-functions.