Automorphic Forms
Formes automorphes
(Org: **Stephen Kudla** (Toronto) and/et **Colette Moeglin** (CNRS-IMJ))

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Global Jacquet–Langlands and automorphic representations

We first explain the local Jacquet–Langlands transfer for all unitary representations. Using this local correspondence one may define a global Jacquet–Langlands correspondence and prove it thanks to the work of Arthur and Clozel on the trace formula for simple algebras. As a consequence one may transfer the results of Moeglin–Waldspurger and Jacquet–Shalika to inner forms of the linear group. In particular we obtain the classification of automorphic representations of the adele group of the group of invertible elements of a central simple algebra of finite dimension over a global field. All fields here are supposed to be of characteristic zero.

PASCAL BOYER, Université Paris 6
Faisceaux pervers des cycles évanescents de quelques variétés de Shimura unitaires

La preuve de la correspondance locale de Langlands en inégales caractéristiques donnée par Harris et Taylor, repose sur l'étude du groupe de cohomologie en degré médian du modèle local dit de Deligne–Carayol. Il se trouve que les autres groupes de cohomologie n'apportent aucune contribution supercuspidale de sorte que l'on peut tout aussi bien étudier la somme alternée de ces groupes laquelle est reliée, via le théorème de Serre–Tate, à la somme alternée des groupes de cohomologie de variétés de Shimura associées à certains groupes unitaires. Cette dernière peut alors être calculée selon un procédé désormais classique de comptage de points via la formule des traces.

Le thème principal de cet exposé sera d'expliquer comment, en utilisant la structure perverse du complexe des cycles évanescents, obtenir chacun des groupes de cohomologie ci-avant, ce qui au passage fournira une preuve de la conjecture de monodromie-poids pour les variétés de Shimura étudiées.

PIERRE-HENRI CHAUDOUARD, CNRS, Université Paris-Sud, Mathématique, Bât. 425, F-91405 Orsay Cedex, France
The truncated Hitchin fibration and the weighted fundamental lemma

The main geometric terms of the Arthur–Selberg trace formula are the weighted orbital integrals. According to Arthur, to stabilize the full trace formula, one needs the weighted fundamental lemma which is a family of complicated identities between p-adic weighted orbital integrals. This is a generalization of the fundamental lemma of Langlands–Shelstad. Ngô Bao Châu recently proved the fundamental lemma of Langlands–Shelstad by a cohomological study of the Hitchin fibration.

My talk will be based on the proof of the weighted fundamental lemma I obtained with Gérard Laumon. I shall introduce a truncated version of the Hitchin fibration such that a weighted orbital integral of Arthur computes the number of rational points of a truncated fiber. I shall explain how to extend the results of Ngô to our situation and how to deduce the weighted fundamental lemma of Arthur.

CLIFTON CUNNINGHAM, University of Calgary
Character sheaves of algebraic groups defined over local fields

At the beginning of the paper introducing character sheaves of connected reductive algebraic groups, George Lusztig wrote:

> This paper is an attempt to construct a geometric theory of characters of a reductive algebraic group G defined over an algebraically closed field. We are seeking a theory which is as close as possible to the theory of irreducible (complex)

characters of the corresponding groups $G(\mathbb{F}_q)$ over a finite field $\mathbb{F}_q$, and yet it should have a meaning over algebraically closed fields. The basic objects in the theory are certain irreducible (ℓ-adic) perverse sheaves ... on G; they are the analogues of the irreducible (ℓ-adic) representations of $G(\mathbb{F}_q)$ and are called the character sheaves of G.

Making use of the *dictionnaire fonctions-faisceaux*, Lusztig then showed that there is indeed a close relation between certain character sheaves of connected reductive algebraic groups G defined over finite fields $\mathbb{F}_q$ and characters of representations of the group $G(\mathbb{F}_q)$.

In this talk we introduce machinery which likewise establishes that there is a close relation between certain character sheaves of connected reductive algebraic groups G defined over local fields $\mathbb{K}$ and characters of certain representations of the group $G(\mathbb{K})$. We do this by considering a family of integral models for G and applying the corresponding vanishing cycles functors to character sheaves of G. The main results of the talk concern techniques by which the resulting families of vanishing cycles of perverse sheaves can be determined.

FRANCOIS DAT, Paris XIII

BROOKE FEIGON, Toronto

PAUL MEZO, Carleton University, Ottawa
Twisted endoscopic character identities

Let G be a connected real reductive group. The theory of endoscopy attaches to G a set of groups whose harmonic analysis is related to G. The precise relationship takes the form of identities involving orbital integrals, or identities involving representation characters. It has been proven by Shelstad. One may generalize this theory by twisting the endoscopic data with respect to an automorphism and quasicharacter of G. The resulting identities of twisted orbital integrals have been established in some cases by Renard. We shall present the conjectured twisted character identities.

SOPHIE MOREL, IAS

FIONA MURNAGHAN, Toronto

MARC HUBERT NICOLE, Jussieu

VINCENT SECHERRE, Université de la Méditerranée–Aix Marseille 2
l-modular representations of inner forms of $\mathrm{GL}(n)$ *over a* p*-adic field with* l *different from* p

Let G be an inner form of $\mathrm{GL}(n)$ over a p-adic field, and let l be a prime number different from p. Our aim is to give a classification of all irreducible smooth l-modular representations of G in terms of the discrete series of its Levi subgroups.

Such a classification has been obtained for $\mathrm{GL}(n)$ by Zelevinsky (for complex representations) and by Vigneras (for l-modular representations). This work relies in particular on the study of the reduction modulo l of irreducible l-adic representations of G. It appears that, unlike the $\mathrm{GL}(n)$ case, integral cuspidal l-adic representations of G may not reduce into irreducible l-modular representations. We study and explain this phenomenon by using the theory of simple types.

Joint work with Alberto Minguez.