

## TITLES AND ABSTRACTS

\*\*\*\*\*

Joel Bellaïche

**Title:** reducibility loci of  $p$ -adic family of Galois representations

\*\*\*\*\*

Gaëtan Chenevier

**Title:** Arthur's conjectures and Selmer groups

\*\*\*\*\*

Henri Darmon:

**Title:**  $p$ -adic methods for calculating points on elliptic curves.

**Abstract:** We will make a survey of the various strategies that are available for efficiently computing points on elliptic curves over global fields. Many of these strategies rely crucially on  $p$ -adic techniques."

\*\*\*\*\*

Matthew Emerton

**Title:** Local-Global compatibility in  $p$ -adic Langlands for  $GL(2)$ .

**Abstract:** In recent years it has been suggested by Breuil that there should be a " $p$ -adic local Langlands correspondence" between two dimensional  $p$ -adic Galois representations of  $G_{Q_p}$  (the absolute Galois group of  $Q_p$ ), and certain  $p$ -adic Banach space representations of  $GL_2(Q_p)$ . Thanks to work of Berger, Breuil, Colmez, and others, this correspondence has been constructed for the so-called semi-crystalline Galois representations.

On the other hand, one can produce Banach space representations of  $GL_2(Q_p)$  by  $p$ -adically completing the étale cohomology of modular curves. The representations so obtained are equipped with an action of  $G_Q$  (the absolute Galois group of  $Q$ ), commuting with the  $GL_2(Q_p)$  action. One conjectures that the restriction to  $G_{Q_p}$  of the Galois action on these representations should be related to the  $GL_2(Q_p)$ -action in precisely the manner described by Breuil's local correspondence. (This is the "local-global compatibility" of the title.)

In this lecture I will explain these ideas in more detail, and discuss some of the recent work (of myself and others) on the problem of local-global compatibility.

\*\*\*\*\*

Haruzo Hida :

**Title:** Mod  $p$   $L$ -values and rational function measures.

**Abstract:**

Fix two distinct primes  $p$  and  $q$  and an odd Dirichlet character  $\phi$ . In the late 1970's, Washington proved that only finitely many Dirichlet  $L$ -values  $L(0, \phi\chi)$  vanish modulo  $p$  when one moves around even Dirichlet characters  $\chi$  of  $q$ -power conductor and  $q$ -power order. We explore a generalization of this results for Hecke  $L$ -values of totally real fields via a combination of Sinnott's algebro-geometric approach and an automorphic idea applied to the multiplicative group  $G_m$ .

\*\*\*\*\*

Adrian Iovita

**Title:** A cohomological construction of  $p$ -adic families of finite slope elliptic modular forms (I).

\*\*\*\*\*

Mark Kisin :

**Title:** F-crystals and crystalline representations

**Abstract:** The classification of crystalline representations has played a key role in the modularity lifting theorems of the type first proved by Wiles and Taylor-Wiles, and then extended by various people. I will explain a new classification of such representations which works in the presence of ramification.

Its applications include a classification of  $p$ -divisible groups and finite flat group schemes conjectured by Breuil, and a conjecture of Fontaine which asserts that a crystalline representation of Hodge-Tate weights  $0,1$  comes from a  $p$ -divisible group.

\*\*\*\*\*

Elena Mantovan:

**Title:** Moduli spaces of  $p$ -divisible groups with relation to the local Langlands correspondences

**Abstract:** Rapoport and Zink constructed certain moduli spaces of  $p$ -divisible groups as local models of Shimura varieties. Just as Shimura varieties are conjecturally related to the Langlands correspondences over number fields, the Rapoport-Zink spaces are conjecturally related to the Langlands correspondences over local fields.

In my talk I will discuss a conjecture explaining how certain aspects of the geometry of these spaces reflect Langlands' functoriality principle.

\*\*\*\*\*

Glenn Stevens

**Title:** A cohomological construction of  $p$ -adic families of finite slope elliptic modular forms, (II): Hecke operators.

\*\*\*\*\*

Eric Urban

**Title:** Derived category and  $p$ -adic families of automorphic representations

**Abstract:** One of the main obstacles in the cohomological construction of  $p$ -adic families of automorphic forms is the presence of torsion in the cohomology of Shimura varieties. The purpose of this talk is to explain how one can get around this difficulty by working in an appropriate derived category of Banach spaces.