Abstract: Glimpses of p-adic Hodge Theory

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In arithmetic geometry, one of the principal aims is to study the absolute Galois group of a number field F or, at least, the action of this group on representations coming from geometry. A good example is the p-adic Tate module of an elliptic curve E defined over F. This action gives a lot of different informations: for example the reduction of the curve at various primes of F. The local behavior of E at those primes changes considerably if a prime $\mathfrak{p}$ of F divides - or not - p: the p-adic world turns out in the first case. A more general class of p-adic representations arising from algebraic geometry is given by the p-adic tale cohomology groups of a smooth and projective variety defined over a p-adic field K.

The goal of p-adic Hodge theory is to study and classify different classes of representation of the absolute Galois group G_K of a p-adic field K. In this seminar I'll present some motivational examples, giving particular emphasis to a theorem of Tate for Abelian Varieties over p-adic fields (as a particular case of the Hodge-Tate conjecture, proved by Faltings). Moreover, I'll try to present some ingredients of the theory of Tate and Sen for the study of the category of C-representations of G_K, following Fontaine.