abstract

JOINT IAS/PU NUMBER THEORY SEMINAR
Topic:

Speaker:

Affiliation:

Date:

Time/Room:

Speaking at a general level, a major goal of the p-adic Langlands program (from a global, rather than local, perspective) is to find a p-adic generalization of the notion of automorphic eigenform, the hope being that every p-adic global Galois representation will correspond to such an object. (Recall that only those Galois representations that are motivic, i.e. that come from geometry, are expected to correspond to classical automorphic eigenforms).

In certain contexts (namely, when one has Shimura varieties at hand), one can begin with a geometric definition of automorphic forms, and generalize it to obtain a geometric definition of p-adic automorphic forms. However, in the non-Shimura variety context, such an approach is not available. Furthermore, this approach is somewhat remote from the representation-theoretic point of view on automorphic forms, which plays such an important role in the classical Langlands program.

In this talk I will explain a different, and very general, approach to the problem of p-adic interpolation, via the theory of p-adically completed cohomology. This approach has close ties to the p-adic and mod p representation theory of p-adic groups, and to non-commutative Iwasawa theory.

After introducing the basic objects (namely, the p-adically completed cohomology spaces attached to a given reductive group), I will explain several key conjectures that we expect to hold, including the conjectural relationship to Galois deformation spaces. Although these conjectures seem out of reach at present in general, some progress has been made towards them in particular cases. I will describe some of this progress, and along the way will introduce some of the tools that we have developed for studying p-adically completed cohomology, the

most important of these being the Poincare duality spectral sequence. This is joint work with Frank Calegari.