

**Speaker:** Claus Sorensen

**Title:** Towards the Breuil-Schneider conjecture

**Abstract:** The  $p$ -adic Langlands program, still in its initial stages, aims to link  $p$ -adic Hodge theory with nonarchimedean functional analysis. For example, if  $F$  is a  $p$ -adic field, one anticipates a correspondence between  $n$ -dimensional potentially semistable Galois representations of  $F$ , and certain unitary representations of  $\mathrm{GL}(n, F)$  on  $p$ -adic Banach spaces. A couple of years ago, Breuil and Schneider gave a precise recipe for a locally algebraic representation attached to a Galois representation (as above) with distinct Hodge-Tate weights. Led by the  $\mathrm{GL}(2)$  case, they went on to conjecture the existence of an invariant norm on this locally algebraic representation (with respect to which one can complete, and get a Banach space). We believe we can prove this in many cases. The seminar will emphasize the case where the associated Weil-Deligne representation is indecomposable. Here the key is to embed the locally algebraic representation in an automorphic representation, using trace formula techniques, and construct the ultimate norm by means of classical  $p$ -adic modular forms. In fact, this works for any reductive group. At the end, we hope to hint at some of the obstacles occurring in decomposable case.