Mini-course 1: "p-adic L-functions for GL$(2n)$ via overconvergent cohomology"

p-adic L-functions attached to automorphic representations and their p-adic families provide powerful tools for attacking important problems such as Birch-Swinnerton-Dyer and Bloch-Kato conjectures. However, they are hard to construct and, except in the case of $GL(2)$, the theory is poorly understood beyond the ordinary case.

We are interested in an approach introduced by G. Stevens based on the study of the overconvergent cohomology of locally symmetric spaces. This method was born in the nineties and at the basis of the most general constructions available for GL(2).

In this mini-course we will describe a construction of p-adic L-functions for certain cuspidal automorphic representations of GL$(2n)$ using overconvergent cohomology. This construction extends previous results of Gehrmann/Dimitrov-Januszewski-Raghuram to the non-ordinary setting and allows variation in p-adic families. More precisely, the mini course is divided in three lectures which we describe below.

- **Lecture 1: 'Critical L-values"** (Andrei Jorza) We recall general conjectures about the existence of p-adic L-functions attached to motives and automorphic representations. Then the lecture is devoted to the study of the critical values of the complex L-function of cuspidal automorphic representations of GL$(2n)$ admitting a Shalika model. In particular we describe such L-values in terms of classical evaluations constructed using the cohomology of the corresponding locally symmetric space and so-called automorphic cycles.
- **Lecture 2: "Overconvergent cohomology"** (Daniel Barrera) We introduce and study the overconvergent cohomology adapted to the Shalika setting. Then we describe how to evaluate this cohomology in order to produce distributions over the expected Galois group. Moreover, we verify that this overconvergent evaluation interpolates the classical evaluations explained in the first lecture. Another consequence of this method is the control of the growth of the distribution obtained. The p-adic L-functions are, as usual, the Mellin transform of these distributions.
- **Lecture 3: "p-adic families"** (Chris Williams) The correct eigenvarieties to be considered in the Shalika setting are constructed using the parabolic subgroup of GL(n) having Levi subgroup GL$(n) \times$ GL(n). After the introduction of these parabolic eigenvarieties the talk is devoted to the study of the local properties of them and the existence of Shalika components. We use such results in order to perform a p-adic variation of the distributions obtained in the second lecture. Using the Mellin transform we produce p-adic families of p-adic L-functions.