LTCC Advanced Course

Title: Modular forms and representations of GL2

Basic Details:
- Core Audience: PhD students interested in learning about the Langlands programme.
- Course Format (**Extended**: 5 x 2hr lectures)

Course Description:

This course is an introduction to the automorphic representation theory of GL2 and can be considered as a second course in modular forms. The material contained in this course is a first look at some of the tools and methods underlying the Langlands programme, a far reaching web of theorems and conjectures comprising some of the most exciting number theory research today. The course will be split into two parts, the first, on the smooth representation theory of GL2 over non-archimedean fields, will not require any knowledge of modular forms. The second will focus on the applications of smooth representations theory to the global theory of modular forms, culminating in the proof of the strong multiplicity one theorem. This course is based on a course previously given by David Loeffler in 2018.

- Recommended reading:
    - `Modular forms and representations of GL2', lecture notes by Loeffler
    - `Automorphic forms and representations', Bump
    - `The Local Langlands conjecture for GL2' (early chapters), Bushnell and Henniart
    - `Introduction to admissible representations of p-adic groups', Casselman
    - `Automorphic forms on adèle groups', Gelbart
    - `Automorphic forms on GL2' Jacquet and Langlands

Prerequisites:
- Should be familiar with the theory of local fields.
- Some knowledge of finite group representation theory isn't essential but it would be useful.
- Should understand basic category theory terminology, particularly adjoint functor relations.
- Basic definitions and properties of modular forms e.g. the first 5 chapters of Diamond and Shurman.

Lecturer Details:
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