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Título: Galois representations attached to modular forms.

Resumen:

Wiles' proof of modularity of semistable elliptic curves over Q was one of the greatest breakthroughs in mathematics of the 20th century. This theorem was then extended by Breuil, Conrad, Diamond and Taylor to include all elliptic curves over Q. One interpretation of modularity is via a correspondence between the representations arising on the p-adic Tate module of an elliptic curve and the p-adic representations associated with certain modular forms. The objective of this project is to study one side of this correspondence, namely, how to associate p-adic representations to modular forms. Towards this objective, some of the key topics we will touch include modular forms, Jacobians, abelian varieties, modular curves and the Eichler-Shimura relation. By the end of the project the student will also be able to understand a few different equivalent versions of the modularity theorem and why they are equivalent.

The main reference for this project is the book "A first course in modular forms" by Diamond and Shurman.