Central values of automorphic L-functions as Fourier coefficients (Holomorphic Case)

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In this expository talk, I will discuss a beautiful formula of Kohnen and Zagier (1981) which gives the central value of an automorphic L-function in terms of the fourier coeffecents of a cooresponding half-integral weight form. In the 1970s, Shimura developed his theory of half-integral weight modular forms, the cornerstone of which is the "Shimura lift", a mapping from a space of weight $k + 1/2$ forms to a space of weight $2k$ forms, which commutes witht he Hecke algebra. The K-Z formula makes explict this lift, giving that the square of the D-th fourier coeffcent of a half-integral weight g form is proportional to the central value of $L(f, D, s)$, where f is the Shimura lift of g, and $L(f, D, s)$ is its L-function after a quadratic twist. I will leave out most proofs, but try to sketch the main result, time permitting. The week following, I will discuss the Maass form case.