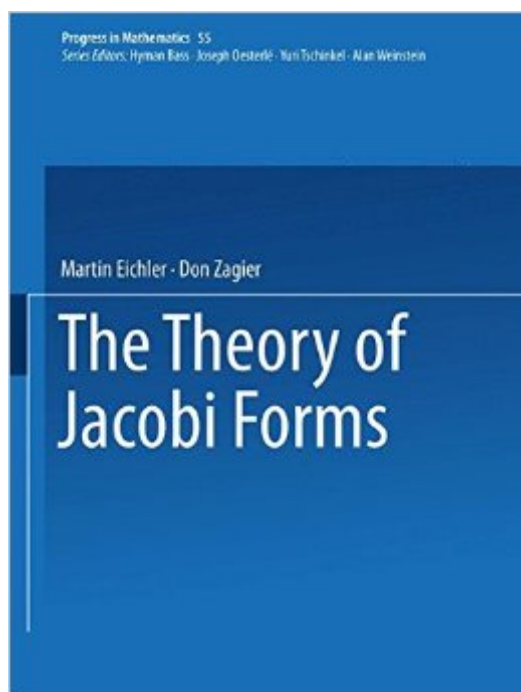


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# The Theory Of Jacobi Forms (Progress In Mathematics)



## Synopsis

The functions studied in this monograph are a cross between elliptic functions and modular forms in one variable. Specifically, we define a Jacobi form on  $SL(2, \mathbb{Z})$  to be a holomorphic function  $\phi$  on the upper half-plane satisfying the transformation equations  $\phi\left(\frac{cT+d}{aT+b}\right) = (cT+d)^{-k} \phi(T, z)$  (1)  $\phi(T, z+h) = \phi(T, z)$  (2)  $\phi(T, z) = \sum_{n \geq 0} \sum_{r \in \mathbb{Z}} c(n, r) e^{2\pi i(nT + rz)}$  (3)  $c(n, r) = 0$  if  $n < 0$  or  $4n \neq k^2$ . Here  $k$  and  $m$  are natural numbers, called the weight and index of  $\phi$ , respectively. Note that the function  $\phi(T, 0)$  is an ordinary modular form of weight  $k$ , while for fixed  $T$  the function  $z \mapsto \phi(-r, z)$  is a function of the type normally used to embed the elliptic curve  $y^2 = 4x^3 - g_2x - g_3$  into a projective space. If  $m = 0$ , then  $\phi$  is independent of  $z$  and the definition reduces to the usual notion of modular forms in one variable. We give three other examples of situations where functions satisfying (1)-(3) arise classically: 1. Theta series. Let  $Q: \mathbb{Z} \rightarrow \mathbb{R}$  be a positive definite integer valued quadratic form and  $B$  the associated bilinear form.

## Book Information

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