Abstract: The work of Andrews, Dyson, and Hickerson (ADH), and, of Cohen show that the fourier coefficients of the function

\[ \sigma(q) = 1 + \sum_{n=1}^{\infty} \frac{q^{n(n+1)}}{(1 + q)(1 + q^2) \cdots (1 + q^n)}. \]

are defined by the arithmetic in \( \mathbb{Z}[\sqrt{6}] \) and can be used to construct a Maass waveform on \( \Gamma_0(2) \). \( \sigma(q) \) is a function studied by Ramanujan.

In this talk, I will discuss the problem of generalizing the results of (ADH) and Cohen. This is joint work, in progress, with Larry Rolen.